ENVIRONMENTAL DISCOURSE IN THE ETHEKWINI MUNICIPALITY: THE ETHEKWINI CATCHMENTS PROJECT

by

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ABSTRACT

Worldwide, it has been recognised that local governments are uniquely placed to bring about positive environmental change in their areas of jurisdiction. This research was conducted to assess how one South African local municipality, the eThekwini Municipality, Durban, is faring in its efforts to achieve sustainability. Hajer's (1993, 1995, 2003) discourse approach to environmental policy making was used as the key theoretical and methodological basis of the research. This approach recognises the power of discourse in shaping how society's relationship with the environment should be managed and sustained. In global environmental politics, ecological modernisation has emerged as the dominant environmental policy discourse and reflects a weak approach to sustainability. An alternative is the strong sustainability discourse, which argues that sustainability cannot be achieved without giving attention to issues of social and environmental justice and including local communities in environmental policy making. These two discourses are used to structure the assessment of environmental policy discourse in the eThekwini Municipality.

A recent municipal project, "eThekwini Catchments 2002: A Strategic Tool for Planning" was used as the research case study. The project provides an assessment of the environmental health of each of the 18 river catchments identified in the municipal area, using environmental indicators. The intention of the project was for this information to be used by municipal planners as a tool for environmental decision-making. Municipal officials, representing several municipal sectors, and the project consultants were interviewed to determine their perspectives on the project. The interview transcripts, as well as the Catchments Project report and other municipal documents, were analysed using Hajer's discourse methodology to uncover the key discourses operating in the municipality that influence environmental policy making. Municipal discourse was then reviewed in terms of the EM and strong sustainability discourses to determine whether the municipality is moving towards stronger sustainability.

This research also contributes to an improved understanding of how discourse shapes environmental policy projects and their outcomes. By identifying the environmental discourse dynamics at work, it is possible to stimulate a more deliberate approach to environmental policy making to bring about positive environmental change in the municipality.

PREFACE

The research described in this thesis was carried out in the School of Life and Environmental Sciences, University of Natal, Durban, from April 2002 to December 2003, under the supervision of Ms. Catherine Oelofse.

This thesis represents original work by the author and has not otherwise been submitted in any form for any degree or diploma to any other tertiary institution. Where use has been made of the work of others, it is duly acknowledged in the text.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF ACRONYMS

ABM	Area-Based Management
ADA	Argumentative Discourse Analysis
CMA	Catchment Management Agency
CMF	Catchment Management Forum
DCED	Drainage and Coastal Engineering Department
D'MOSS	Durban Metropolitan Open Space System
EIA	Environmental Impact Assessment
EM	Ecological Modernisation
ESMP	Environmental Services Management Plan
GIPO	Geographical Information and Policy Unit
IDP	Integrated Development Plan
LA21	Local Agenda 21
LTDF	Long Term Development Framework
LUMS	Land Use Management System
NEMA	National Environmental Management Act
SCA	Strategic Catchment Assessment
SDF	Spatial Development Framework
SMS	Sustainability Management System
USD	Urban Strategy Department
WMA	Water Management Area
WUA	Water User Association

CHAPTER ONE: INTRODUCTION

1.1 Introduction

Global and national environmental policy initiatives, such as Local Agenda 21, recognise the important role that local governments can play in bringing about sustainable development (Gibbs et al., 1996). Many environmental problems originate in local activities and therefore impact on the local environment (Blowers, 2000). Consequently, it is at local level that the opportunities exist to make the most effective environmental changes. Local governments play a critical role in managing economic and social development in their areas of jurisdiction (UNCED, 1992). As local governments are in closer contact with their population than other levels of government, they are obliged to be more accountable for their actions. Policy aimed at sustainable development can therefore have a considerable impact at the local level (Hooper et al., 1999; Rees, 1999; UNCED, 1992).

Since the demise of apartheid in 1994, a range of new legislation has been promulgated in South Africa relating to development, the environment, and municipal responsibilities. Sustainable development has emerged as one of national government's key approaches. Municipal governments are urged to promote development in their respective areas in a sustainable manner. The key question, then, is how are South African municipalities faring in this drive toward sustainability? This research considers how one metropolitan municipality, the eThekwini Municipality, Durban, is responding to the sustainable development challenge. An environmental policy project recently undertaken by the municipality, "eThekwini Catchments 2002: A Strategic Tool for Planning", was used as the research case study.

According to Sharp (1999: 139), much of the literature on local environmental policy aimed at sustainable development implies that "a single and unproblematic goal of sustainability is being pursued". In practice, this is far from true – sustainability can be interpreted in different ways, depending on the particular perspectives of environmental policy makers. A discourse approach to environmental policy enables the exploration of these complexities, by revealing how different perspectives on how sustainability is to be achieved (environmental discourses) result in particular environmental policies and practices. Hajer's (1993, 1995, 2002, 2003) discourse approach to environmental policy making is therefore used as the theoretical and methodological framework of this research. His approach enables an in-depth exploration of

discourse dynamics in the eThekwini Municipality related to the Catchments Project, with particular implications for environmental policy making.

While a range of perspectives on the environment and sustainability can be identified, ecological modernisation has emerged as the dominant environmental discourse in global environmental politics. Ecological modernisation recognises the 'environmental problem' but believes that, within the context of the current path of economic growth, technology, science and management approaches can bring about adequate environmental change (Hajer, 1995; Christoff, 1996; Blowers, 2000). However, an alternative environmental discourse, the strong sustainability discourse, argues that ecological modernisation promotes a weak form of sustainability, as it ignores issues of social and environmental justice, power and the inclusion of communities in environmental decision-making (Hajer, 1995; Harvey, 1996; Oelofse et al., 2002). As contrasting 'ideal types', these two environmental discourses structure the assessment of the eThekwini Municipality's approach to sustainability. In South Africa's context as a developing country with associated socio-economic challenges, this research is based on the premise that a strong sustainability approach needs to be incorporated into municipal environmental policy making.

1.2 Research rationale

The rationale for this research is based on several aspects related to improving sustainability in the municipal context. Since national legislation promotes sustainability in municipal development, it is important to monitor how municipalities are progressing in their efforts toward sustainability. The eThekwini Municipality is a large metropolitan municipality facing a range of social and development challenges, due in part to municipal restructuring and associated new roles and responsibilities. These challenges and responsibilities have considerable impact on how environmental policy making is approached. The municipality is also influenced by dominant global approaches to environmental policy making. Discourse analysis can reveal these complexities and influences, assisting the municipality to approach future environmental policy making in a more deliberate way. The choice of the eThekwini Catchments Project as a case study in environmental policy making was partly motivated by the researcher's working experience in town and regional planning. The project was initiated and managed by the Urban Strategy Department of the municipality to provide an environmental tool to guide city planners in development decision-making. The researcher's interest in the integration of planning and environmental management to improve city sustainability was thus a further key motivation for the research.

1.3 Aims and objectives

The aim of this study is to explore environmental policy discourse in the eThekwini Municipality, with specific reference to the eThekwini Catchments project, in order to determine the implications for sustainability in the municipal area.

To structure the achievement of this aim, a number of objectives have been identified. These objectives outline the key areas of research:

1. What are the key environmental policy discourses operating in the eThekwini Municipality, both general and specific to the eThekwini Catchments project?

2. How do these discourses align with the global environmental discourses of ecological modernisation and strong sustainability?

3. How are environmental policy discourse dynamics played out in the eThekwini Municipality? Which discourses dominate and how has this discourse institutionalisation been achieved? What does this indicate about discourse institutionalisation in the municipal context?

4. How can discourse analysis contribute to improved sustainability and environmental decision-making in the municipal context?

The research aim and objectives provided the framework for the choice of theory and methodology employed in this research. These are discussed in more detail in the following section, which outlines the structure of the thesis.

1.4 Structure of the thesis

Chapter One introduces the study and provides the rationale for the research. It sets out the research aim and objectives which structure the way the research was conducted.

Chapter Two provides the theoretical foundation of the research. It first provides a short overview of environmental politics and policy making, before introducing the role of discourse in shaping how society perceives reality. This is followed by a review of the two environmental discourses that structure this research - ecological modernisation and strong sustainability. The chapter then proceeds to a detailed discussion of discourse theory and the dynamics of discourse interaction in the institutional context of the municipality. Hajer's argumentative discourse

analysis approach and concepts, which structure the research methodology, are then presented. The chapter concludes with a discussion of the how discourse analysis can be used to facilitate deliberative and interactive policy making.

Chapter Three presents an overview of the eThekwini Catchments Project within the broader context of the eThekwini Municipality and national legislation. The economic, spatial, social and biophysical aspects of the eThekwini municipal area are first explored, followed by a synopsis of the institutional structure of the municipality. Key national legislation influencing municipal governance, development and environmental management is then discussed, as well as specific municipal initiatives which relate to the case study project. The eThekwini Catchments Project is presented last, by discussing the project process and the detail of the final project report.

Chapter Four describes the methodology used to carry out this research. Since this study is based on a social constructionist approach to reality, discourse analysis was used to uncover the ways that environmental policy in the eThekwini Municipality is socially constructed through language. The majority of the research data was generated through interviews with municipal officials and the project consultants. This chapter presents the data sources for the research and discusses the interview process. It then describes the discourse analysis framework, and details how this was used to undertake discourse analysis. A discussion of the limitations of the research concludes the chapter.

The findings of the research are presented in two chapters - Chapter Five explores environmental discourse at a broad municipal level, while Chapter Six studies the catchment discourse, associated with the eThekwini Catchments Project, in more detail.

Chapter Five first places municipal environmental discourse in the national legislative context by exploring how the ecological modernisation and strong sustainability discourses are reflected in South African legislation. The key terms of municipal policy discourse (epistemic notions, policy vocabularies and story-lines) are then presented in detail, by referring to the discourse of municipal officials and municipal documents. Municipal environmental discourse is then reviewed to determine its alignment with the ecological modernisation and strong sustainability discourses.

Chapter Six is concerned with one municipal discourse, the catchment discourse, the key discourse associated with the eThekwini Catchments Project. The role and influence of the project consultants is first discussed, in terms of how they influenced the project process and outcomes. This is followed by a detailed analysis of the terms of the catchment discourse, which reveals the connections and disjunctures between this discourse and other municipal discourses. The catchment discourse coalition is then examined, followed by a discussion of possible reasons why institutionalisation of the catchment discourse has not occurred. Lastly, the alignment of the catchment discourse with the EM and strong sustainability discourses is assessed.

Chapter Seven concludes the thesis by examining two key aspects of the research. It first considers the value of Hajer's discourse approach in gaining an understanding of environmental policy making in the municipal context. Secondly, an alternate catchment approach is presented, which suggests a strong sustainability approach to the use of the catchment concept in environmental policy making.

1.5 Conclusion

This research aims to explore environmental policy discourse in the eThekwini Municipality, using the eThekwini Catchments project as a case study in environmental policy making. The broader intention of the project is to determine how environmental policy discourse reflects the municipality's approach to sustainability, and how a discourse approach can contribute to positive environmental change in the municipal context. The following chapter introduces and explores discourse theory and concepts, as well as the ecological modernisation and strong sustainability discourses, to provide a strong theoretical foundation for the remainder of the thesis.

CHAPTER TWO: ENVIRONMENTAL DISCOURSE – THEORY AND PRACTICE

2.1 Introduction

This study of environmental discourse within the eThekwini Municipality is grounded in current research in environmental politics. Over the past four decades, growing concern relating to the negative impacts of human development on the environment has led to the emergence of institutions at an international and national level devoted to environmental management and sustainable development. Most countries now have environmental ministries at national level, related environmental legislation has been passed, and national and local governments are obliged to give far more consideration to environmental issues than ever before. At a local government level, programmes such as Local Agenda 21 have been initiated to integrate environmental concerns into local development and planning. Aside from the infusion of environmental concerns into formal institutional and power structures, environmental issues are also a growing concern of the business sector, civil society, non-government organisations and individuals. Environmental issues have therefore become political issues.

It has been recognised that the municipal context is particularly important for bringing about positive environmental change, because it is at a local level that environment impacts are most widely experienced, and therefore where the opportunities exist to make the most effective changes (Gibbs et al., 1998; Sharp, 1999; Blowers, 2000; Rees, 1999). Local governments tend to be in closer contact with their population, as well as more accountable for their actions. Policy aimed at sustainable development can therefore have a considerable impact at the local level (Rees, 1999). By focusing on the municipal context, this research aims to uncover how the ecological modernisation and strong sustainability discourses are influencing policy-making and development decision-making, and what this means for achieving stronger sustainability at a local level.

The intention of this chapter is to provide a general overview of how environmental politics and policy making in the municipal context can be understood using a discourse approach. The chapter first gives a brief overview of environmental politics and policy making. It then introduces discourse and discusses its role in shaping society's view of reality. A review of the global environmental discourse of ecological modernisation, and its alternative, strong

sustainability follows. This provides the foundation for an in-depth discussion of discourse theory and the dynamics of discourse interaction in the institutional context of the municipality. Hajer's argumentative discourse analysis approach and concepts, a key element of the research methodology, are then presented. The chapter concludes by considering the value of a discourse analysis approach in deliberative and interactive policy making.

2.2 Environmental politics and policies

Compared to most political issues, for example education or health, 'the environment' as a political subject has unique qualities (Jacobs, 1997). Environmental issues cut across almost all political sectors in a variety of ways, and require diverse policy approaches involving a range of interest groups and institutions. The multi-dimensionality of environmental issues involves the intersection of two complex systems: human social systems and ecological systems (Dryzek, 1997). As ecological systems interact with social, economic and political systems, environmental issues are characterised by high levels of uncertainty and complexity (ibid). Newby (1993, cited in Jordan and O'Riordan, 1999: 70) states that environmental matters

> "...are deeply political, raising concerns about the expansion of individual choice and the satisfaction of social needs, about individual freedom versus a planned allocation of resources, about distributional justice and the defence of private property rights, and about the impact of science and technology on society. Beneath the concern for 'the environment' there is, therefore, a much deeper conflict involving fundamental issues about the kind of society we wish to create for the future".

These complexities are especially evident in the municipal government context, where municipal politicians and officials constantly make decisions with environmental and social consequences. This research is concerned with the way environmental politics plays itself out in municipal government. In other words, how are environmental issues and problems translated into policies and decision-making? And more specifically, how are environmental problems constructed and prioritised by different municipal actors, why do certain issues get environmental policy attention and others not, and how are environmental policies conceptualised?

To answer these questions, it is first useful to consider what policy is and how policy is developed. There is no one definition of policy – it can take the form of formal decisions, law, programmes or actual practice (Keeley and Scoones, 2000). Environmental policy can be

defined simply as "public policy concerned with governing the relationship between people and the environment" (McCormick, 1999, cited in Jordan and O'Riordan, 2000: 81). Traditionally, policy scientists have viewed policy formation as a sequential process starting with problem emergence, and moving through the stages of agenda setting, consideration of policy options, adoption of policy options, implementation and evaluation - a process very much managed by political and administrative institutions or powers (Hajer, 1989; Keeley and Scoones, 2000; Jordan and O'Riordan, 2000). However, more recently it has been recognised that policy-making is a far more complex process, particularly in an environmental context. It is

> "a diverse, diffuse, complicated activity, where sometimes competing, sometimes overlapping policy positions are presented by a range of different groupings of actors, including scientists, administrators, NGO personnel, government officials, ... people and politicians" (Keeley and Scoones, 2000: 90).

Policy-making and consequent administrative action is therefore not a simple sequential activity. The process consists of a "multitude of circles, loops and feedback curves" (Hajer, 1989: 23). The formulation of policies, and their consequent transformation into administrative or political action, is affected by context-specific circumstances and a network of actors. Policies are the product of complex social relationships through which ideas are articulated (Giddens, 1984, cited in Healey, 1999). Hajer (1989) argues that policymaking is politics. The issues that receive policy attention are the outcomes of power relations, ideological disagreements and political conflict (Ockwell, 2001). Opposing positions result from different assumptions, perspectives and world views. Policy issues are interpreted in different ways because of this range of perspectives (Keeley and Scoones, 2000; Dryzek, 1997).

While there are different ways of conceptualising and explaining the environmental policy process, this research is based on a discourse approach, drawn mostly from Hajer's work (1993, 1995, 2002, 2003) on the politics of environmental discourse. Falling within the post-structuralist school of thought, a discourse approach gives attention to the central and constructive role of language in policy formulation and decision-making.

2.3 The power of discourse

In recent years, a changing perspective on the role of language in politics, policy-making, and society in general has become evident in the social sciences and in particular in the policy sciences (Hajer, 1993, 1995, 2002; Fischer and Forester, 1993; Fairclough and Wodak, 1997;

Hastings, 1999; Atkinson, 1999; among others). In the positivist tradition, language was seen as a neutral means to describe reality. As explained by Ortony (1993, cited in Butteriss et al., 2000), "(a) basic notion of positivism was that reality could be precisely described through the medium of language in a manner that was clear, unambiguous, and in principle, testable". Within the policy context, therefore, policy language was assumed (and still is by many) to be a "neutral medium through which ideas and an objective world can be represented and discussed" (Darcy, 1999, cited in Ockwell, 2001: 5). However, with the 'linguistic turn' in the social sciences, new tools and methodologies have been developed in an attempt to uncover the relationship between language, social structures and power relationships. This has exciting possibilities for an improved understanding of the political process and policy formulation.

The power of language has been recognised in its ability not only to describe the world but to create it, that is, to shape society's view of reality (Hajer, 1993; Fairclough and Wodak, 1997). "As politicians know only too well but social scientists too often forget, public policy is made of language" (Majone, 1989, in Fischer and Forester, 1993:1). Language plays a key role in determining what issues or problems receive political and policy attention. In a political context actors will have different definitions of an issue or problem, since such issues or problems are socially constructed (Hajer, 1995). Of interest is how certain issues or definitions of an issue are included or excluded through the use of language; therefore how the political process can be studied as the mobilisation of bias (Hajer, 1995, 2002). As claimed by Schattschneider (1960, cited in Hajer, 1995: 42),

> "(a)ll forms of political organisation have a bias in favour of the exploitation of some kinds of conflict and the suppression of others because organisation is the mobilisation of bias. Some issues are organised into politics while others are organised out"

Exploring the links between language and policy formulation, therefore, can demonstrate how the social construction of issues and problems occurs and how this leads into the establishment of certain institutional frameworks and practices.

'Discourse' is the term generally used to describe a way of talking or writing about reality (Fairclough and Wodak, 1997). Environmental discourse is a particular way of talking and thinking about environmental politics (Hajer, 1995). Dryzek (1997:8) describes discourse as "a shared way of apprehending the world. Embedded in language, it enables those who subscribe to it, to interpret bits of information and put them together into coherent stories or accounts". However, as Ockwell (2001: 4) notes, discourse is a "complex and contested term, with roots in

both social theory and linguistics". From Hajer's social constructivist perspective, discourse has a more extensive meaning. Hajer (1995:44) describes discourse as

> "a specific ensemble of ideas, concepts and categorisations that are produced, reproduced, and transformed in a particular set of practices and through which meaning is given to physical and social realities".

This more complex definition of discourse relates not only to the content of what is being written or said, but also to its context, the social practices in which it is produced, the actors involved, and its ability to transform and give meaning to social reality (Hajer, 1995). Discourse is essentially contextual – it is "time- and space-specific ... (and) reflects our past experiences and present preoccupations" (Hajer, 1995: 17). The ideas, concepts and categories that constitute a discourse vary from one to another. They may be normative or analytical, and based on historical references, physical realities or myths (ibid). Discourses frame problems and provide the tools to construct problems, distinguishing some aspects of a situation above others. Beyond this, discourses produce and reproduce meaning through an identifiable set of practices (Hajer, 2002). Therefore discourse has a clear institutional dimension (Hajer, 1995).

From this perspective discourse is itself a form of social practice (Fairclough and Wodak, 1997). This implies a dialectical relationship between discourse and its context. Discourse is shaped by social situations, institutions and social structures, but it also shapes situations and the social relationships between people and groups of people. It can sustain and reproduce the current social status quo, as well as contribute to its transformation. The social influence of discourse (and hence language) is therefore extremely powerful. Discursive practices can help produce and reproduce power relations, and have important ideological effects in society (ibid).

In the environmental politics context, environmental policy discourses can be identified that frame and influence environmental decisions and debates. They offer different perspectives on how society's relationship with the environment should be managed and sustained. The influence of these environmental discourses extends beyond those with an interest in environmental matters, to all those who find themselves in the position of engaging in environment-development issues, including politicians, bureaucrats, lawyers and ordinary citizens (Dryzek, 1997). In a local government context, therefore, environmental discourses can be found reflected in the written and spoken word of most officials and certainly all politicians as they grapple with development decisions and policy formulation.

The discourse of ecological modernisation has emerged as the dominant environmental policy discourse in global environmental politics today. This discourse exerts considerable influence on how national and local governments, business, NGOs and even individuals conceptualise the relationship between the environment and society. The following section explores the ecological modernisation discourse, outlining its key aspects. It then presents a critique of ecological modernisation by suggesting strong sustainability as an alternative discourse. This provides the context for a more in-depth discussion of discourse theory and its application to environmental policy making in the institutional context of the municipality, as well as acting as a framework for the discourse analysis undertaken as part of this research.

2.4 An environmental discourse framework

2.4.1 Ecological modernisation

Ecological modernisation has variously been described as a technical theory, a policy discourse, an approach to development, a concept or term, and even as a belief system (Hajer, 1995; Christoff, 1996; Blowers, 1997; Buttel, 2000; Seippel, 2000; Berger et al., 2001). As this research focuses on a discourse approach to environmental policy making, ecological modernisation is interpreted as an environmental policy discourse as conceptualised by Hajer (1995). The literature on ecological modernisation continues to evolve, since the concept first originated through the work of German sociologist Joseph Huber in the 1980s. Buttel (2000) and Christoff (1996) explore these nuances in more detail. However, this review of ecological modernisation will not focus on the differences in interpretation, but will rather attempt to give a general overview of the key aspects of the discourse.

Since the "environment-development" debate first started in earnest in 1972 at the UN Conference on the Human Environment, substantial changes have occurred in environmental politics (Hajer, 1995; Duarte, 1999). The way that environmental policies are conceptualised has changed from the 1970s notions of "limits to growth" to assumptions that economic development and environmental protection can be reconciled (Pepper, 1999; Duarte, 1999). The emergence of the new policy discourse of ecological modernisation in the 1980s "recognises the structural character of the environmental problematique but none the less assumes that the existing political, economic, and social institutions can internalise the care for the environment" (Hajer, 1995: 25). In other words, from this perspective there is no inherent conflict perceived between environmental protection and economic growth; in fact they can be mutually supportive (Murphy, 2000).

The key aspects of ecological modernisation (EM) are:

1. Environmental protection is perceived as a source of economic growth by emphasising the mutually reinforcing benefits of resource efficiency and waste minimisation (Pepper, 1999; Christoff, 1996). The internalisation of environmental impacts and associated costs through the concept of 'pollution prevention pays' has led to tremendous growth in waste management, recycling and associated technological innovation. EM is conceptualised as a positive approach to environmental management with associated economic benefits. It uses the language of business to stress the cost-effectiveness and efficiency of changing to improved environmental management practices, leading to improved market competitiveness (Hajer, 1995; Christoff, 1996). Drawing from Mol, Berger et al. (2001: 57) refer to this as "the institutionalisation of ecology into the social practices of production and consumption ... to redirect economic practices into more ecologically sound ones".

2. A key focus of EM is the role of technology and innovation in bringing about environmental change, aimed at reducing pollution emissions on-site and encouraging more efficient use of resources, including the use of renewable resources and the conservation of energy (Christoff, 1996; Murphy, 2000; Blowers, 2000; Berger et al., 2001). As Hajer (1995: 32) argues, the EM discourse turns the 'ecological crisis' upside-down – "a threat to the system now becomes a vehicle for its very innovation". EM suggests that through the development of more sophisticated technologies environmental problems can be addressed. Innovation has also been encouraged in the development of environmental policy, through the introduction of economic concepts, mechanisms and principles which encourage environmental reform (Murphy, 2000; Berger et al., 2001).

3. Ecological modernisation perceives environmental protection as a management problem (Hajer, 1995). Through the combined efforts of society – government and the private sector - the environmental problem can be adequately managed and controlled. EM suggests that there is "a techno-institutional fix for the present problems" (Hajer, 1995: 32).

4. The growing influence of the EM discourse has led to a more dominant role for science and scientific experts (Hajer, 1995). Science has taken on the role of identifying environmental problems and solutions. Debate surrounding environmental issues is "conducted via scientific evidence and counter-evidence in a culture of expertise" (Blowers, 1997: 851). Systems ecology and more integrative ecological ideas relating to carrying capacity have

become important in environmental policy and decision-making processes (Hajer, 1995). EM thus relies on the quantitative measurement of environmental degradation and environmental impacts (Oelofse et al., 2002).

5. New environmental policy principles and techniques have been developed, allowing for the environmental costs of development to be internalised. These include "the polluter pays principle, cost-benefit analysis, risk analysis, the precautionary principle, tradable pollution rights and the levy of charges on polluting activities, as well as ... resource taxes and emission taxes" (Hajer, 1995: 27).

6. EM promotes greater integration of environmental policy goals into all areas of government, recognising that effective environmental management can be achieved only through realignment of broader policy goals (Murphy, 2000). This is reflected in a more integrated and interdisciplinary approach to environmental management, evident in initiatives such as integrated catchment management. This is also manifested in a more integrative regulatory approach which aims to achieve administrative efficiency and limit regulatory overload on the public (Christoff, 1996).

7. The state's relationship with business has also changed under EM from strictly regulatory to more participative and enabling. State-business partnerships reflect a relationship which is "complementary rather than conflictual" (Blowers and Pain, 1999: 266). EM encourages co-operative and voluntary arrangements with industry, opening up new ways of regulating environmental impacts (Christoff, 1996). The state therefore plays the role of encouraging companies to undertake self-regulation, by providing a "framework of incentives and standards for environmental performance" (Blowers, 2000: 378). This corresponds with changes world-wide in state relations with the public, including South Africa, which have moved from government to governance (Berger et al., 2001).

8. EM also encourages the involvement of the public in environmental policy making. A range of participation procedures and methodologies have been developed to ensure more democratic policy making (Oelofse et al., 2002). In the urban context, participation approaches include Local Agenda 21 which is aimed at promoting sustainable city development (Blowers and Pain, 1999).

9. Related to the above, the rise of the EM discourse has seen environmental groups increasingly being involved in collaborative relationships with business and government as part of environmental policy making processes (Blowers, 1997; 2000; Mol, 2001). By accepting the environmental problem, EM "seeks to bring to an end the sharp antagonistic debates between the state and the environmental movement that were characteristic of the 1970s" (Hajer, 1995: 28-29). The EM discourse therefore internalises potential conflict in the environmental arena (Harvey, 1996). This interesting change shows how the EM discourse has been credible enough to be appropriated by many environmental groups. Duarte (1999) suggests that the reasons for this shift are complex, but in part relate to an active strategy by environmentalists to legitimate their claims in negotiations with the state and business.

10. Lastly, EM ultimately seeks the restructuring of national economies resulting in industrial sectors "which combine higher levels of economic development with lower levels of environmental impact" (Gouldson and Murphy, 1997, cited in Murphy, 2000:2). This would see the shift of emphasis away from resource and energy intensive industries to service and knowledge based industries at a national level. However, this does not account for the continuation of resource and energy based industry elsewhere in the world to meet global demands.

A review of the discourse of EM would be incomplete without drawing attention to its pivotal concept of *sustainable development* which has emerged over the past two decades as the dominant theme in international and local debate concerning development and the environment. In many ways, EM is a synonym for sustainable development (Buttel, 2000). Sustainable development has been defined and interpreted in countless ways. Officially launched in the 1987 Brundtland report, sustainable development was defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, cited in Duarte, 1999: 61). Despite a range of interpretations, it is generally recognised that environmental, economic and social concerns need to be integrated to ensure that development is sustainable. In global, regional and local development politics, the principles of sustainable development are regularly drawn on in policy-making and practice, as well as by business and environmental groups (Berger et al., 2001; Duarte, 1999). This is becoming increasingly evident in the South African context at a national and local level.

Hajer (1995) explores how broad consensus around the concept of sustainable development has been reached from parties with widely differing views. He presents sustainable development as a story-line (a concept which will be elaborated on later in this chapter) that has united a wide range of role-players in environmental politics at global and local levels. Sustainable development's vagueness allows "people with hitherto irreconcilable positions in the environment-development debate to search for common ground without appearing to compromise their positions" (Lélé, 1991: 607). The paradox of the sustainable development concept is that its vagueness is both its strength and weakness. More radical positions on sustainability can be submerged in the broadness of the concept.

Despite being premised on a greater awareness of the ecological limitations to development, Duarte (1999) argues that sustainable development is still essentially a modernist concept, focusing on economic growth and technological innovation as the means to overcome problems of poverty and underdevelopment. The concept of sustainable development can therefore be considered as a key uniting factor leading to the growing dominance and power of the ecological modernisation discourse in environmental politics. As Harvey (1996: 382-3) contends,

> "Indeed, it is not impossible to imagine a world in which big industry ..., big governments (including the World Bank) and establishment, high-tech big science can get to dominate the world even more than they currently do in the name of 'sustainability', ecological modernization and appropriate global management of the supposedly fragile health of planet earth".

2.4.2 A critique of ecological modernisation

Harvey's quote above alludes to the fact that the discourse of ecological modernisation as an approach to achieving sustainable development is not without its critics. EM has been criticised on a number of fronts:

Firstly, EM takes for granted the ideal of development as economic growth. Consequently, the practices of EM reproduce this modernist paradigm (Duarte, 1999; Seippel, 2000). This suggests a revival of mainstream development theory (Christoff, 1996). EM is "a moderate and conservative theory confirming business as usual" (Blowers, 1997: 853). It has wide appeal since it does not require any major changes to contemporary economic imperatives, which still tend to take priority in development decisions. Hajer and Fischer (1999: 3) contend that EM and

its story-line sustainable development are caught in "the culture of progress", which believes that, once recognised, environmental problems "can be handled by the institutions of science, technology and management". EM therefore does not encourage existing institutions to question the normative and cultural premises underlying their practices (Hajer and Fischer, 1999). For those who believe that the free market economic system is a root cause of environmental degradation, poverty and underdevelopment, EM presents serious shortcomings.

Secondly, EM is based entirely on western or Eurocentric industrial experience (Blowers, 1997; Christoff, 1996). EM discourse assumes that western affluence and growth can be universally applied in a sustainable way. While aspects of modernisation may apply equally well in developing countries, others have proved to be unsustainable. As Blowers (1997: 854) notes, "(s)ubsistence economies which are prevalent over much of the South may actually be more sustainable than modern agricultural systems based on the intensification of production". The wholesale appropriation of EM discourse could have dangerous results in developing countries which depend upon primary resource exploitation to fund local economic growth (Christoff, 1996; Blowers, 2000). The assumed conditions for EM – "economic prosperity, an efficient market, technological advancement, an enabling state and a plural, inclusive society" - are either not present or are poorly developed in developing countries (Blowers and Pain, 1999: 267). In a country like South Africa, which is grappling with transformation, high levels of poverty and lack of capacity, the conditions are not fully present for EM to be applicable.

Some of the negative effects of the EM approach are evident in the pulp and paper making industry in SE Asia. While EM's influence has resulted in cleaner production technologies, it has not led to a decrease in the use of resources, otherwise termed "dematerialisation" (Sonnenfeld, 2000). Technological innovation in production has also resulted in job losses with associated high costs to society. EM therefore exhibits serious shortfalls in its application to the developing world, and does not consider alternative approaches to development and sustainability, based on non-western cultural experience.

Thirdly, a related factor is that EM explicitly avoids addressing the social contradictions that earlier environmental discourses suggested (Hajer, 1995; Blowers, 1997; Berger et al., 2001). EM rather focuses on technocratic and institutional solutions, giving precedence to efficiency at the cost of social equity (Oelofse et al., 2002). EM does not call for structural change to the economic status quo, and ignores the fundamental issues of social justice, redistribution and democracy that should accompany a more sustainable approach to development (Pepper, 1999;

Guldbrandsen and Holland, 2001). It neglects to give attention to the divergent interests reflected in society and particularly to wealth and power inequalities, which act as a barrier to co-operation in environmental decision-making (Blowers, 1997; Oelofse et al., 2002). This is especially relevant when considering the appropriateness of EM discourse in South Africa's developing context, characterised by high levels of social inequality.

EM tends to focus on the physical or environmental aspects of sustainability (Blowers and Pain, 1999). A reliance on science and technology for problem solving and environmental management means that "social and development issues are sidelined as they are difficult to both conceptualise and measure" (Oelofse et al., 2002: 4). For example, sustainability indicators tend to emphasise the ecological dimension while neglecting social issues (Blowers and Pain, 1999). While new EM participation approaches involve the incorporation of public inputs into decision-making, many remain legitimising processes with very little power sharing. Participation processes often reinforce the important partnership between business and government, while other groups are marginalised (ibid).

A fourth criticism of EM discourse is its national focus. By focusing on changes within nation-states, EM ignores the global dimensions of economic development in relation to sustainability issues. While certain European countries may be making strides in reducing waste and resource consumption, much of this is because environmental impacts have been displaced elsewhere in the world, particularly to developing nations (Christoff, 1996; Blowers and Pain, 1999; Blowers, 2000; Cohen, 2001). A related factor is globalisation itself. The pressures placed on countries to perform in the international marketplace have led to increased export dependency, specialisation and a lack of local control (Pepper, 1999; Mol, 2001). Globalisation tends to reinforce the economic growth of core areas at the expense of peripheral developing countries. EM fails to consider the environmental impacts of globalisation, which are often related to issues of poverty and control over local resources. It is therefore not compatible with aims of achieving global sustainable development (Blowers, 2000).

Lastly, Cohen (2001) points to the apolitical nature of EM. By reducing the role of the state and turning instead to the market, business and science to bring about improved environmental responsibility, EM provides fewer opportunities for direct political engagement (ibid). As Guldbrandsen and Holland (2001: 130) note, since business is considered apolitical and "a taken-for-granted good", it is not questioned in the same light as stronger environmental positions which are often construed as political and even radical. This is illustrated in

Guldbrandsen and Holland's (2001) research into the American Heritage Rivers Initiative in North Carolina and Virginia. This project, which is aimed at preserving the ecological and cultural integrity of the New River, exhibits all the trademarks of ecological modernisation, expressed in a partnership between the state, business and environmental NGOs. These environmental groups are encouraged to engage as equal partners, however in reality they are obliged to temper their positions and concerns in line with economic imperatives (ibid). As such, EM often excludes the consideration of more politically sensitive environmental issues or concerns.

EM theorists such as Mol (2001), Frijns et al. (2000) and Sonnenfeld (2000) argue for adjustments in the current western-based EM discourse to overcome its inadequacies related to the local development dynamics of developing countries, particularly within the context of globalisation. However, this perspective still upholds the central tenets of EM, focusing on continued modernisation while taking consideration of, and adapting to, environmental and societal constraints. Essentially EM is based on a belief in progress and the capacity of modern technologies and techniques to manage environmental problems (Oelofse et al., 2002.) Consequently critics perceive the EM discourse as promoting a weak form of sustainability (Pepper, 1999; Oelofse et al., 2002). Conversely, a more radical alternative to EM has been put forward, which can be broadly defined as the strong sustainability discourse.

2.4.3 An alternative to EM: The strong sustainability discourse

In contrast to the relatively cohesive nature of the EM discourse, the alternative, strong sustainability, is less well defined. Some may even argue that there is no cohesive strong sustainability discourse. This in part due to the fact that the discourse of strong sustainability is firstly a critique of EM and modernisation in general (Blowers, 1997). Pointing out the deficiencies of EM (as outlined above), the strong sustainability discourse suggests what needs to be considered and done to aim for stronger sustainability. The discourse draws from a range of ideological and theoretical viewpoints including social, ecological and environmental justice, ecosocialism, neoMarxist demodernisation perspectives, and deep ecology (Harvey, 1996; Blowers, 1997, 2000; Pepper, 1999; Taylor, 2000). While these represent some diverse and even oppositional viewpoints, they share the following common aspects:

1. In broad terms this alternative discourse contends that "nothing less than fundamental social and economic changes" are required to cope with the global environmental crisis (Blowers, 1997: 846). Current global economic and social systems based on a capitalist approach to

development need to be substantially altered to achieve sustainable development. Institutional and social arrangements require restructuring and economic thinking needs to be transformed (O'Riordan, 1993; Gibbs et al., 1998). How exactly this is to be achieved is the subject of much debate, and some radical perspectives would even argue for a stateless, moneyless and marketless economy (Pepper, 1999). Others argue for an increased role of the state to ensure that the poor and disadvantaged receive protection and assistance from the state, particularly in light of the increased vulnerability of these groups in a global economy. The provision of state support structures, including welfare, housing, social services, education and health are still vital to ensure that environmental conditions do not deteriorate further (Blowers, 1997).

2. However, whatever form economic change should take, the importance of the local context is emphasised as being the key focus of efforts leading to sustainability (Pepper, 1999; Blowers, 2000). More and more frequently local problems are caused by geographically distant consumers and producers (Gould et al., 1996, cited in Blowers, 2000). To counteract the effects of globalisation and the international economy, therefore, the strong sustainability discourse argues for decentralisation and the reassertion of localism, to create "protective space" for local communities and regions (Pepper, 1999: 25). Linked to this then would be a decreasing dependency on external markets, through increased self-reliance, autonomy and self-determination. This would also involve a focus on meeting basic needs through self-sufficiency (ibid).

3. Central to strong sustainability is the need to address issues of social inequality, which are intricately linked to issues of power, through environmental and social justice (Blowers, 1997; Taylor, 2000). The poor are the most vulnerable to environmental impacts and change, and are unequally exposed to environmental hazards. The environmental justice movement, which originated in the USA, has politicised these inequalities, drawing attention to the need to ensure justice in all development decision-making. While the environmental justice movement has focused on the exposure of marginalized groups to pollution, its precepts are applicable to all kinds of developmental impacts and concerns. Environmental justice "puts the survival of people in general, and of the poor and marginalised in particular, at the centre of its concerns" (Harvey, 1996: 386). It therefore moves beyond concern for the biophysical environment alone to recognise the complex human dimensions of the environmental problem. In other words, it is "a people-orientated way of addressing 'environmentalism' that adds a vital social, economic and political element" (Szasz, 1994:

153, cited in Harvey, 1996: 410). Dealing with environmental problems requires a confrontation with the fundamental underlying processes that generate social and environmental injustices, leading to the transformation of these processes (Harvey, 1996). These would include "power structures, social relations, institutional configurations, discourses and belief systems" (ibid: 401).

4. Linked to this is the need to promote the participation and empowerment of affected individuals in any development context. While EM discourse promotes the participation of all stakeholders in environmental decision-making, it tends to depoliticise the environmental debate. However, in reality, many environmental impacts are the direct result of unequal power relations, and participation approaches are not adequately applied to deal with these issues of power. Strong sustainability argues for the redistribution of power, allowing for local communities to take control of, or at least contribute to, decision-making that affects their livelihoods and living environment. This requires a commitment to "a participatory framework of decision-making which provides people with effective power" (Blowers, 1997: 867). While participatory democracy is not without its difficulties, including lengthy and contradictory decision-making and participation fatigue, sustainable change requires that people are given greater freedom and responsibility (Blowers, 1997; Oelofse, et al., 2002).

5. Essential too, is ensuring that the concerns of local communities are not excluded by their use of non-scientific or non-technical language. Expert discourses have often been deployed by those in positions of political or economic power to attempt to diminish the importance of local viewpoints or concerns (Harvey, 1996). Scientific or other formal institutionalised arguments should be balanced by local discourses, arguments and traditional forms of knowledge.

The strong sustainability discourse thus gives voice to a range of concerns or issues most strongly expressed at a local level and by or for those who have experienced the inequalities of the current development paradigm. It brings together a diverse group of interests from urban communities in the North dealing with environmental justice issues, to radical green movements seeking alternative sustainable lifestyles, to rural communities in the South dependent on natural resources for their livelihoods. How then can the strong sustainability discourse make an impact on the status quo in environmental politics? Bond (1999: 28) argues that for meaningful change to happen requires transcending these diverse interests through the establishment of stronger alliances "between community, labour and environmental activists", both at a local and

global level. As Harvey (1996: 401) contends, "the environmental justice movement has to radicalise the ecological modernisation discourse". This requires dealing with

> "the material and institutional issues of how to organise production and distribution in general, how to confront the realities of global power politics and how to displace the hegemonic powers of capitalism not simply with dispersed, autonomous, localised, and essentially communitarian solutions ..., but with a rather more complex politics that recognises how environmental and social justice must be sought by a rational ordering of activities at different scales. ...such a movement will have no option, as it broadens out from its militant particularist base, but to reclaim for itself a nonco-opted and nonperverted version of the theses of ecological modernisation" (ibid: 400-401).

For a developing country such as South Africa, the strong sustainability discourse offers a more socially relevant approach to managing the relationship between society and the environment. It recognises the social contradictions and complexities of the 'environmental problem', and suggests that if meaningful change is to occur on the road to sustainability, more attention needs to be given to issues of social justice, inclusion and empowerment.

2.4.4 A sustainability continuum

In concluding this section, it must be kept in mind that while the EM and strong sustainability discourses are contrasted here as incompatible opposites, they are in a sense "ideal types" (Blowers, 1997: 852). In practice, there is a continuum of possibilities between these two discourses (Gibbs et al., 1998). It is helpful to conceptualise sustainability as a pathway towards meeting the goals and principles of sustainable development (Oelofse et al., 2002). EM can therefore be understood as a weak form of sustainability. While the story-line of sustainable development has been appropriated as EM's pivotal concept, it can also be interpreted in other ways representing strong sustainability. It therefore represents two different conceptualisations of sustainability. Hajer and Fischer (1999) argue that it is not the concept of sustainable development that is problematic, but its interpretation.

What is critical in the context of the eThekwini Municipality is how these discourses are being drawn on in environmental policy making. As the next section explains, elements from multiple discourses can be drawn on by the same institution and its officials at the same time. Consequently, both the EM and strong sustainability discourses can be in operation simultaneously in the municipality. It is the power of these discourses both individually and in relation to one another which can indicate whether environmental policy making is moving in a

sustainable direction. In order to gain an understanding of how discourses such as ecological modernisation and strong sustainability interact and influence environmental policy making, the following section provides an in-depth review of discourse theory. Particular attention is given to the role of human agency in the production and reproduction of discourses within institutional structures such as municipalities.

2.5 Environmental discourse dynamics

2.5.1 A social constructivist approach

There is a wide range of approaches to discourse and how it can be understood and analysed. These include the social constructivist approach of Hajer, the more linguistic Neo-Marxist approach of Fairclough, which both draw substantially from Foucault, and the broader approach of Dryzek who rejects Foucauldian notions of discourse (Ockwell, 2001). Each of these approaches produces alternative views of how discourse influences the policy process.

This research is based on a social constructivist approach and draws widely from Hajer's work (1993, 1995, 2002) on environmental discourse, as well as from Sharp's (1999) research on the relationship between environmental policy and discourse in a local government context. Both Hajer and Sharp are influenced strongly by Foucault's discourse theory. This section of the chapter first turns to a review of Foucault's ideas, which is followed by a discussion on the role of structure and agency in discourse dynamics, with particular reference to the institutional context. This paves the way for more detailed consideration of Hajer's "argumentative discourse analysis" approach, which will be used as the methodological basis of this research into environmental discourse in the eThekwini Municipality.

2.5.2 Foucault's discourse theory

Foucault developed the idea that power and knowledge is transmitted through discourse (Richardson, 1996; Sharp, 1999; Tait and Campbell, 2000; Hastings, 1999). He attempted to uncover the deeper dynamics of power and knowledge within and between discourses – i.e. how "power appropriates knowledge and weaves it into discourses" (Richardson, 1996). As interpreted by Layder (1994, cited in Richardson, 1996: 282), "Foucault's interest is the link between regimes of power based on conjunctions of discourses, knowledge and practice. In this analysis, discourse is seen as the meeting point of power and knowledge".

Foucault made important claims about the relationship between power and discourse. Firstly, he claimed that power is prior to language, meaning that language use is motivated by power and is

a reflection of power (Fairclough, 1992, McHoul and Grace, 1993 and Burr, 1995, cited in Hastings, 1999). Secondly, he claimed that language use plays a central role in the way that power relations are realised (McHoul and Grace, 1993, cited in Hastings, 1999). Discourse therefore serves power in the sense that it concretises power or makes it real (Hastings, 1999). From this perspective, discourses can be defined as

> "socially grounded interpretative frameworks ... (which act) as powerful forms of knowledge which structure what can be thought, said and done by social actors" (Meinhof and Richardson, 1994, cited in Hastings, 1999: 10).

Another important idea developed by Foucault is that power is not a feature of an institution per se, but is defined relationally. Power is defined in terms of how institutions and actors are implicated in discourses (Hajer, 1995). The power of an institution is permanent only in so far as it is a constant feature of the discourses through which the role of that institution is being produced (ibid). This illustrates the instability of discourses and their potential to change, and therefore to alter power relations. The operation of a particular discourse therefore involves not only its own reproduction but the potential stimulation of counter-discourse:

> "We must make allowance for the complex and unstable process whereby discourse can be both an instrument and an effect of power, but also ... a point of resistance and a starting point for an opposing strategy. Discourse transmits and produces power; it reinforces it, but also undermines and exposes it, renders it fragile and makes it possible to thwart it" (Foucault, 1990, cited in Richardson, 1996: 281).

A key element of Foucault's understanding of power is that a range of discourses operate at any point in time in "perpetual and fluid competition" (Foucault, 1999, cited in Sharp, 1999: 146). A review of politics or history over time would not reveal a linear movement from one discourse to another, but rather the many overlapping discourses in operation and their changing influence over time (Sharp, 1999; Hajer, 1995). In the same way, the world of discourse is not divided into a dominant and a dominated discourse (Foucault, 1976, cited in Hajer, 1995). Although discourse analysis aims to uncover and identify particular discourses, the definition of one discourse from another could be considered to some extent an arbitrary process due to this overlapping nature of discourses (Sharp, 1999). Thus within the institutional context of the eThekwini Municipality, it should be possible to identify a range of overlapping discourses with different power effects.

By focusing on the "plurality of discourses" Foucault attempted to explain the play of dependencies and discontinuities within and between discourses (Hajer, 1995). He was interested in how "a multiplicity of discursive elements ... come into play in various strategies" (Foucault, 1976 in Hajer, 1995: 50). His idea of the "tactical polyvalence of discourses" explored how various discursive elements together create a new "discursive space" within which problems can be discussed (Hajer, 1995). This draws attention also to the structuring ability of discourse - how discourse has the potential to create new realities or new ways of talking and thinking about reality.

Foucault emphasised that discourses contain internal rules that allow them to constrain human behaviour and maintain discursive order (Hajer, 1995). Discourses imply prohibitions since they make it impossible to raise certain questions and steer thought and action in a particular direction (Atkinson, 1999). In this way discourses can be exclusionary, only authorising certain people to participate (Hajer, 1995), for example, the power of academic disciplines to exclude certain people or issues. Discourses structure "what is ... sanctioned as thinkable and ... bestow upon particular individuals/ organisations the right to determine the appropriate (i.e. legitimate) scope of operations, form(s) of organisation, operating procedures, etc" (Atkinson, 1999: 61). This is useful for understanding how discourses structure institutional arrangements and procedures in the eThekwini Municipality in a certain way, excluding other possibilities.

Sharp (1999) and Bevir (1999) draw attention to Foucault's contention that discourses need to be searched for in the detail of policies and actions. Hence, all small actions are tied to wider aims and objectives, reflective of a wider discourse (Sharp, 1999). The effects of an action (i.e. the working out of power) betray the discourse that these actions promote (ibid). These ideas were explored in Foucault's work on political institutions. He argued that the key to understanding an institution is in terms of the ideas and concepts that give that institution its character (Bevir, 1999). A decentred study of an institution will reveal how it is created, sustained and changed through the meanings and ideas of a range of micro-practices (ibid). From this perspective, the study of political institutions, such as the eThekwini Municipality, involves the study of the processes and activities in which that institution is involved. We are encouraged to conduct research from the "bottom up", to analyse political institutions in terms of "local attempts to find solutions to a host of particular local difficulties" (Bevir, 1999: 356). Consequently, this research analyses one 'micro-practice', the eThekwini Catchments Project, to uncover the key discourses influencing environmental decision-making in the city.

Foucault's theory of discourse contributes a great deal to our understanding of the linkages between power and discourse, particularly how the power of institutions or authorities is maintained or changed through discourse. The strength of his theory "lies at the level of discursive practices and the interaction and coalescence of discourses" (Hajer, 1995: 51), that reveals the complex, overlapping plurality of discourses, which are constantly in a state of flux. Especially relevant to research in a local government context are his views that institutional practices (including policies and administrative action) are reflective of the wider discourses in operation.

However, a number of criticisms have been levelled against Foucault's theory, particularly in terms of its restrictions on the role of human agency and its shortcomings when applied in an empirical context (Bevir, 1999; Tait and Campbell, 2000; Hajer, 1995). In contrast to the now widely held belief in the social sciences of the dialectical relationship between structure and agency, Foucault played down individual strategic action, and therefore the role of the subject in discourse production and reproduction. In other words, the role of the discoursing subject remains ambivalent (Hajer, 1995). Foucault tended to focus on the way individuals are constructed by regimes of power, hence rejecting the idea of an autonomous subject. By minimising human agency, his work remained at the level of social discourses, neglecting interpersonal discursive interaction (Hajer, 1995). The individual is seen instead as "an effect of power" (Bevir, 1999: 349). "His emphasis always remains, therefore, on the ways in which the social world makes the subject, not the ways in which the subject makes the social world" (Bevir, 1999: 357). Using Foucault's understanding of discourse in this research would therefore ignore the role played by municipal officials and politicians in the production and reproduction of discourses. Due to these limitations, Hajer (1995) argues for the need to develop more appropriate discourse theory that gives space to human agency and the role of individual strategic action in discourse interaction.

Although Foucault points to the important linkages between local practices and wider discourse, his work has also been criticised for the conceptual gap between abstract theory and the study of concrete political events, particularly at a local contextual level (Hajer, 1995; Tait and Campbell, 2000). This problem may be influenced by Foucault's treatment of discourses as objects, which draws attention away from the practices and contexts in which they are embedded (Potter, 1996, cited in Tait and Campbell, 2000). Abstract discourses are seen to interact with other abstract discourses without giving attention to other ways in which discourses are constructed (Tait and Campbell, 2000). Linked to this, Foucault neglected the relations between discursive and non-discursive practices, in the sense of how discursive

practices are influenced by non-discursive and material practices (ibid). The role of the material world in social action is understated, elevating language as the sole force of social change. Tait and Campbell (2000) believe that the connections between abstract and practical need to be enhanced, in order for Foucault's theory to be more useful for empirical research. This study of discourse in the eThekwini Municipality provides an opportunity to illustrate these connections.

2.5.3 Structure – agency and the institutional context

In order to remedy, in a sense, Foucault's limited attention to human agency, both Hajer and Sharp subscribe to a more balanced view of structure and agency. Hajer draws from Gidden's concept of the "duality of structure" (Giddens, 1984, cited in Hajer, 1995). This is based on the premise that individuals are not completely free to act independently, but act within the context of the structures of society (Hajer, 1989). However, individuals also constantly reproduce and/or transform society and societal structures (Bhaskar, 1979 in Hajer, 1989). Therefore structures are conceived not only as constraints to action and human agency, but as enabling the transformation of society (Hajer, 1989, 1995). The relationship between structure and human agency is a dialectical relationship - structure and agency are interrelated and inseparable. Acts of power are only brought about through the relationship between individuals and societal structures. Structures alone cannot bring about societal change. As summarised by Hajer (1995: 58),

> "social action originates in human agency of clever, creative human beings but in a context of social structures of various sorts that both enable and constrain their agency. ...(S)ociety is reproduced in this process of interaction between agents and structures that constantly adjusts, transforms, resists, or reinvents social arrangements".

Taking this one step further into a discursive context, Sharp argues that individuals may be both "structurally influenced by the discourses to which they are exposed, but also to exercise some of their own agency in the reproduction of discourses" (Sharp, 1999: 148). Individuals' particular circumstances will determine which discourses they are exposed to, and therefore the discourses that they may reproduce in their personal and professional capacity. However individuals still do have a choice as to which discourses to subscribe to or appropriate, and which to dismiss, even though this is generally done unconsciously. These acts of human agency therefore make an important contribution to discursive reproduction (ibid). It follows that individuals in the municipal context play a key role in the reproduction of multiple discourses. It is also possible for individuals to reproduce contradictory discourses in different contexts or circumstances (Sharp, 1999).

The way in which discourses interact with individuals can be applied to institutions (ibid). In fact, Hajer (1995) argues that institutional arrangements are a precondition for the process of discourse formation and change. Institutions and their associated practices (whether they be policies, programmes or structures), require discursive "software" to operate and produce effects. It is the interaction of individuals within the institutional context that is key to Hajer's argumentative discourse analysis approach (which will be discussed in more detail in the next section). As with individuals, the political realm of institutions is influenced and characterised by a plurality of discourses, particularly in environmental politics in municipalities, where problems are complex and comprise many different aspects (Hajer, 1993).

Environmental discourse is not one coherent whole, but the discussion of a particular environmental problem will involve a number of discourses (Hajer, 1995). Actors can and do draw their arguments from more than one discourse at a time. A policy document on a certain issue may draw discursive elements from a variety of discourses. In the municipal context, specifically, influential sources of discourses will include national policy guidelines, legislation and even political party directives (Sharp, 1999). These discourses will compete for influence over the municipality, and this discursive competition will be "played out in terms of many small struggles (or non-struggles) over policy wording, decision-making structures, policy monitoring devices, resource allocation, and the detail of policy initiatives" (Sharp, 1999: 149). Similarly, municipalities produce and reproduce a range of discourses. Due to the volume of discourses produced and reproduced by institutions, the potential for discursive inconsistency, or contradictory discourses, is heightened (Sharp, 1999).

According the Hajer, the relative influence of a discourse in an institutional context is expressed through the processes of discourse structuration and discourse institutionalisation. Discourse structuration occurs when a discourse begins to dominate the way the institution conceptualises the world, i.e. if actors draw on a certain discourse to ensure their credibility in particular context (Hajer: 1993, 1995). This can occur at the level of policy documentation and in policy debates and rhetoric (Healey, 1999). Discourse institutionalisation occurs when a successful discourse solidifies into institutional arrangements, organisational practices and policies, or as traditional ways of reasoning (Hajer, ibid). Thus the institutional structure and dominant practices and procedures of a municipality can indicate whether a particular discourse has been institutionalised. Hajer (1995) notes that a discourse can be considered hegemonic when both discourse structuration and institutionalisation are achieved.

An institutionalised discourse can exert considerable power in the municipal context. Actors working within the frame of an institutionalised discourse can use their positions to persuade or force others to interpret and approach reality as they do (Hajer, 1993). Once institutionalised, however, a discourse still needs to be continually drawn upon (or reproduced) to retain its power. As Hajer notes, drawing from Davies and Harré, "discourse is reproduced through a sequence of speech situations" (Hajer, 1995: 55). The rules and conventions that constitute the social order need to be confirmed and reproduced in actual speech situations, for example, in documents and debates. Nonetheless, an institutionalised discourse can be difficult to change, due to its reproduction through institutional arrangements and practices. Sharp (1999) raises the important point that this discursive reproduction builds on longevity – in other words, through policy statements, programmes and institutional decision-making structures, discourses continue to be reproduced long after a decision on those statements, programmes and structures was made.

Institutional structures probably play the strongest role in entrenching a particular discourse. For example, a decision to split up environmental management functions in a municipal context into sectoral issues (e.g. air, water) can restrict the development of new ideas and related practices until reorganisation occurs (Sharp, 1999). This also illustrates the difficulty of deliberate policy-making efforts to bring in a new discourse to structure institutional action. The introduction of a new policy discourse may appear successful in that it begins to be drawn upon by a range of actors. However, unless it filters down from the conceptual level of discourse structuration to the level of policy practices and/or structures, i.e. institutionalisation, it cannot be said to have achieved its intentions (Healey, 1999). The issue of discourse institutionalisation is of particular relevance to this research, which seeks to discover whether the discourse associated with the eThekwini Catchments Project has been institutionalised.

This discussion of discourse in the institutional context provides a strong theoretical foundation for the analysis of the discourse dynamics in the eThekwini Municipality. However, to undertake empirical discourse analysis requires some practical tools. As presented in the next section, Hajer (1995, 2002, 2003) has developed some helpful concepts for use in discourse analysis. These form part of his "argumentative discourse analysis approach".

2.6 Hajer's argumentative discourse analysis approach and concepts

2.6.1 Argumentative discourse analysis

Hajer's approach to discourse is built on the strengths and foundation of Foucault's work, but gives more attention to the role of human agency in discourse dynamics. The theoretical concepts and methodology devised by Hajer have been used by a number of researchers in recent years to explore the relationship between discourse and policy outcomes, mainly in the environmental and planning policy contexts (for example, Bulkeley, 2000; Ginger, 2000; Healey, 1999; Ockwell, 2001; Sharp, 1999, among others). The strength of his approach is that it has both theoretical depth and practical applicability in empirical research, something that Hajer has deliberately tried to achieve (Hajer, 1995).

Hajer's approach has been developed in what he calls the "argumentative discourse analysis (ADA) tradition" (Hajer, 2002: 2). Hajer speaks of an argumentative turn, rather than a linguistic turn, in the social sciences (Hajer, 1993, 2000; Fischer and Forester, 1993). As Billig (1987, in Hajer, 2002:2) contends,

> "to understand the meaning of a sentence or whole discourse in an argumentative context, one should not examine merely the words within that discourse or the images in the speaker's mind at the moment of utterance. One should also consider the positions which are being criticised, or against which a justification is being mounted. Without knowing these counter-positions, the argumentative meaning will be lost".

This element of Hajer's work draws from discourse theory in the field of social psychology. The work of authors such as Harré, Davies and Billig overlaps to some extent with Foucault, but focuses on the level of interpersonal interaction, which Hajer refers to as "social interactive" discourse theory (Hajer, 1995: 52). From this perspective, the human subject is actively involved in the production and transformation of discourse (Hajer, 1995). Actors are perceived as "active, selecting and adapting thoughts, mutating and creating them, in the continued struggle for argumentative victory against rival thinkers" (Billig, 1989 in Hajer, 1995: 54). Environmental politics is therefore understood as an argumentative struggle in which actors not only try to make others appropriate their understanding of problems, but also seek to position actors in a certain way (Hajer, 1995). In the municipality, therefore, municipal actors play a key role in the production and reproduction of municipal discourse.

Hajer (1995) suggests that three factors determine the relative power of discursive arguments – credibility, acceptability and trust. Credibility requires that actors believe in and can appropriate the particular argument into their own context. Acceptability relates to the whether an argument appears necessary or attractive. Trust allows for any doubts or uncertainties to be disregarded by virtue of confidence in the author of the argument, or in the practices which support that argument.

ADA therefore goes beyond analysing arguments or contrasting interpretations of facts or reality. It explores the process of argumentation, the practice within which actors are involved - how actors position one another through language use or how they are positioned through discourses (Hajer, 2002). Consequently ADA can be used to gain insights into how individuals and institutions compete argumentatively to establish a particular version of reality that will promote their objectives (Jacobs, 1999). By analysing interpersonal communication and policy documentation in a particular policy context, the key perspectives on reality that are upheld through argumentative discourse can be revealed (Hajer, 1995; Ginger 2000). Policy documents should therefore be analysed beyond their technical content (Ginger, 2000). In fact, argument can be considered as the link between technical information and policy recommendations (Ginger, 2000). Policy documents "can be understood as a form of argumentative discourse" in which authors of policy "frame issues and make normative arguments through technical analysis" (Ginger, 2000: 292).

While individual human agency and choice play an important role in discourse production and transformation, social-interactive discourse theory also recognises the "considerable power of structured ways of seeing" (Hajer, 1995: 56). In other words, not all argumentative positioning is as a result of a conscious process of choosing or excluding certain positions. It is here that Hajer puts forward the two key concepts of his ADA approach – the story-line and the discourse coalition. Working within an argumentative understanding of discourse, these concepts provide the key structuring elements for undertaking empirical discourse analysis, as used in this research.

2.6.2 Hajer's key concepts – the story-line and discourse coalition

Hajer defines story-lines as "narratives on social reality through which elements from many different domains are combined and that provide actors with a set of symbolic references that suggest a common understanding" (Hajer, 1995: 62). The great power of story-lines is their ability to regulate conflict by providing common ground between discourses, and therefore to

suggest unity despite the variety of separate discursive components of a problem or issue. The concept of the story-line is based on the assumption that "the potential power of a text is not derived from its consistency but from it multi-interpretability" (Hajer, 1995: 61). Story-lines act as "discursive cement" that creates communicative networks among actors with different or overlapping perspectives (ibid: 63).

A story-line is accepted and used in a particular context because it "sounds right", based on the plausibility of the argument, the credibility of the author of that argument and the acceptability of the practice in which it is produced (ibid). Story-lines are powerful political devices. They help construct problems, and play an important role in the creation of the social and moral order in a particular domain. Through story-lines, actors are positioned, and roles and responsibilities are defined (ibid). Acting as metaphors, story-lines allow for the discursive complexity of a problem to be reduced, thereby creating opportunities for problem closure. They also allow different actors to expand their own understanding of a problem beyond their own discourse of expertise or experience. In other words, story-lines provide narratives that allow a variety of actors to illustrate where their work fits into the broader context of a particular problem (ibid). Once story-lines are accepted and used by more actors, they get a ritual character, giving permanence to a debate and rationalising a specific approach to the problem.

By reducing complexity and uniting diverse interests, story-lines have the ability to disempower, by drawing attention away from the contextual (situated) or social understandings of a problem (ibid). Vague story-lines which can be interpreted in a variety of ways by different actors, with different social and cognitive commitments, replace complex disciplinary debates. In the process key issues will get ignored or left out, and debates can be concluded prematurely before these issues have been given sufficient attention (ibid). As such, story-lines can promote certain interests while excluding others.

The concept of the story-line is based on Hajer's claim that discursive understanding is made permanent by the "routinisation of cognitive commitments" (Hajer, 1995: 56). This refers to the process whereby a person adopts a specific position and then sees the world from that angle, and in terms of the "images, metaphors, story-lines and concepts of that position" (Davies and Harré, 1990, cited in Hajer, 1995: 56). Routinised forms of discourse can be well entrenched in an institutional context, for example in the institutional arrangements and practices of a municipality. They are particularly effective because they avoid confrontation, as to argue against these routinised understandings is to argue against the institution itself. Discursive

interaction within the "walls of routinised institutional structures" (Hajer, 1995: 57) is therefore restricted and limited to the accepted ways of talking about a particular problem.

To explain how story-lines unite a diverse range of actors around a shared issue or problem, Hajer has developed a second key concept - the discourse coalition. This he defines as "an ensemble of (1) a set of story-lines; (2) the actors who utter these story-lines; and (3) the practices in which this discursive activity is based" all organised around a discourse (Hajer 1995:65; 1993). Discourse coalitions are formed if previously independent practices are related to one another through the uniting force of a shared story-line and its associated discourse (ibid). The key advantage of the discourse coalition concept is that it shows how different actors and organisational practices can help to reproduce or entrench a certain perspective, without necessarily sharing core values or co-ordinating their actions (Hajer, 1993). Thus in a municipality, discourse coalitions could be formed around shared story-lines that are relevant to a range of municipal actors, even though these actors may represent a range of municipal functions and perspectives that are not necessarily aligned.

Discourse coalitions are different from political coalitions in the sense that they are linguistically based (story-lines are the foundation, not political interests) and the scope of participants is broader, due in part to the vague nature of story-lines and their ability to draw a wide range of role-players (ibid). Unlike political coalitions, a shared understanding of a policy problem does not necessarily mean that members of a discourse coalition share a similar worldview (Bulkeley, 2000). However, this does not mean that the use of a discourse and its story-lines does not have power effects. In fact, the unity of a range of otherwise politically unconnected role-players around a shared story-line can exert considerable political influence.

Using these concepts, Hajer (1995: 65) explains how ecological modernisation is based on a number of "credible and attractive" story-lines. These include: "sustainable development is the alternative to the previous pathway of defiling growth", "regulation of the environmental problem appears as a positive-sum-game", "pollution is a matter of inefficiency", and "anticipation is better than cure" (ibid). It is especially the most dominant story-line of sustainable development that has drawn together a diverse range of players from around the world to create the "first global discourse-coalition in environmental politics" (Hajer, 1995: 14). This discourse coalition shares a way of talking about the environment and development, but includes members with widely different agendas and worldviews. Because of the diverse nature of the members of this discourse coalition, sustainable development as a story-line has become

vague and can be interpreted in numerous ways. The paradox is that this coalition can only be held together by the vagueness of its story-line (ibid).

Hajer (1993, 1995) has also used these concepts to explore the politics of acid rain in the UK and the Netherlands. His work indicates that alternative discourse coalitions to the hegemonic status quo, may achieve discourse structuration, but discourse institutionalisation is much harder to achieve (Bulkeley, 2000). If discourse coalitions are not aligned to institutionalised policy communities, their impact and therefore their chances of discourse institutionalisation are reduced (ibid). Another important point raised by Bulkeley is that actors can "draw on different story-lines in different contexts and therefore move between discourse coalitions" (ibid: 734). This has important implications for research in that discourse analysis may reveal how actors are aligned with or influenced by elements of different discourses in different contexts. It is therefore not possible to neatly divide actors into different discourse coalition groupings. Rather, research should focus on illuminating the discourses at play in specific contexts and how actors are grouped in different discourse coalitions depending on the particular issues being debated or discussed at the time.

The story-line and discourse coalition concepts are key elements of the discourse analysis methodology introduced by Hajer (2003) in his recent work on nature development in the Netherlands. Hajer's approach is used as the methodological framework for this research, and is therefore outlined in more detail in Chapter 4. However, at this point it is useful to introduce two further discourse concepts, which are key components of Hajer's methodology – policy vocabularies and epistemic notions.

2.6.3 Hajer's discourse analysis framework: policy vocabularies and epistemic notions

Hajer divides his methodological framework for empirical discourse analysis into three elements: firstly, the study of the 'terms of policy discourse', secondly the formation of discourse coalitions around shared story-lines, and thirdly, the analysis of the institutional practices in which discourses are produced (Hajer, 2003: 103). The first element, the 'terms of policy discourse' are relevant here, and are defined as "institutionalised structures of meaning that channel political thought and action in certain directions" (Connelly, 1983, cited in Hajer, 2003: 104). These terms consist of three layers which structure a discourse, as illustrated in Table 2.1 below.

Table 2.1 Hajer's terms of policy discourse (adapted from Hajer, 2003: 104)

Terms of Policy Discourse
1. Story-lines, myths and metaphors – (crisp) generative statements that that bring together previously unrelated elements of reality and thus facilitate discourse coalition formation.
2. Policy vocabularies – sets of concepts structuring a particular policy, consciously developed by policy makers.
3. Epistemic notions – rules of formation that underpin theories/policies but are not 'formulated in their own right'

The first layer consists of the story-lines, myths and metaphors that assist in sustaining the support for a particular policy programme (Hajer, 2003). As discussed in the previous section, story-lines are short narratives that 'help people to fit their bit of knowledge, experience or expertise into the larger jigsaw of a policy debate' (ibid: 104). Both metaphors and myths simplify discursive complexity, enabling people to discuss complex policy issues.

Policy vocabularies, the second layer, are the "sets of concepts structuring a particular policy, consciously developed by policy makers" (Hajer, 2003: 105). Policy vocabularies are drawn from specific theories or policy fields, such as catchment management or environmental science, to provide the conceptual basis of a policy. They play a key role in structuring government policy documents, such as white papers, and determine the nature of legitimate policy action (Hajer, 2003).

The third layer concentrates on the formative power of epistemic notions, defined as "a regularity in the thinking of a particular period, structuring the understanding of reality without actors necessarily being aware of it" (Hajer, 2003: 106). Epistemic notions are dominant ideas or concepts that influence policy formation, but without being specifically formulated for that purpose. These broadly applicable ideas can be appropriated by a range of policies in different fields, for example the concepts 'network' and 'infrastructure' in Hajer's (2003) case study in the Netherlands.

Thus the story-lines, epistemic notions and policy vocabularies reflected in discourse are able to exert power in policy contexts by framing issues in certain ways. The discourse analysis

approach of this research is aimed at uncovering these terms of policy discourse to determine how language shapes environmental policy making in the eThekwini Municipality.

2.7 A critical role for discourse analysis

The preceding discussion has shown how discourse analysis, and in this instance, Hajer's argumentative discourse analysis, can be employed to explore the dominance of particular ideas or discourses within environmental politics and policy-making. Discourse analysis therefore plays the critical role of exposing power inequalities "hidden within language use" (Ockwell, 2001: 50). This has consequent emancipatory possibilities, which leads us to the question: how then can discourse analysis be used as a strategic resource to make a practical impact in environmental politics in a municipal context?

Discourse analysis can play a role "at the level of practical politics by opening up the terms of the debate and encouraging a critical approach to policy-making" (Jacobs, 1999: 210). Put simply, "discourse opens ways to recreate society" (Hajer, 1995: 263). Here Hajer puts forward his ideal of "reflexive ecological modernisation". Reflexive ecological modernisation is "a democratic process of deliberate social choice out of alternative scenarios of development (or indeed non-development)" (Hajer, 1995: 280). The concept of reflexivity is based on Beck's (1986) thesis of a risk society. Beck argues that the global ecological crisis is due to the structural deficits of the institutions of industrial society, in that institutions are increasingly unable to handle the dangers that they themselves produced (Hajer, 1995). In response to this ecological crisis and its associated risks, Beck (1997) suggests that "reflexive modernisation" - meaning self-confrontation and self-transformation - is taking place in society.

Giving a discursive spin to Beck's risk society, Hajer (1995: 280) defines reflexivity as "a quality of discursive practices that illuminates the effect of certain social and cognitive systems of classification and categorisation on our perceptions of reality". Hajer argues that the challenge for reflexive ecological modernisation is to find appropriate institutional arrangements in which different discourses and concerns can be "meaningfully and productively related to one another" (ibid: 281). This is essential if environmental politics is to encourage the mobilisation of opinions that are independent of respected authorities and institutions, such as municipalities. Such forms of public debate, that uncover the hidden assumptions and agendas of role-players, would allow for reflection on the kind of development that society wants at a local level.

These ideas align with current approaches towards achieving more democratic institutional practices, such as deliberate democracy, discursive design, environmental mediation, round tables, consensus-building, more inclusionary and argumentative approaches to planning, and the global move in general from government to governance (Hajer, 2003; Hajer and Kesselring, 1999; Fischer and Forester, 1993; Forester, 1999; Healey, 1994, 1996, 1999; Burgess et al., 1998). Partly as a result of an increased lack of trust in political systems and scientific authority, there has been a growing demand for more democratic policy making in the past decade (Ockwell, 2001; Burgess et al., 1998).

Hajer's recent work (2003) on the discourse of nature development in the Netherlands, analyses the confrontation in environmental politics between institutionalised science-based discourses and local ways of ascribing meaning to reality (Hajer, 2003). This confrontation led to a broader and more inclusive approach to development. To Hajer, this story demonstrates that different interactive policy-making practices are needed in which local actors are represented, and which stimulates public deliberation and reflection on the future. The work of researchers in urban policy and planning, such as Healey (1996) and Rydin (1998b), promotes the use of discourse analysis to "construct opportunities for dialogue and new forms of politics" (Jacobs, 1999: 205), or in other words, to "explore ways of developing inter-discursive policy formulation" (Healey, 1994: 43). In fact, one way of approaching inclusionary participation is to view it as the task of creating a new shared discourse (Healey, 1996). Discourse theory can therefore be put to normative use.

Discourse analysis can also be used as a tool for environmental dispute resolution. It "provides a systematic and substantive basis for a mediator to develop better understanding of each party's position, and thus to be able to engage more productively in the dispute negotiation process" (Butteriss et al., 2000: 7). Discourse analysis can unearth assumptions; reveal value judgements, norms and motives; show the nature of struggles between ideologies; and expose practices that mask power relationships (ibid).

Key to such an approach is an understanding of how environmental politics in government contexts is dominated by scientific experts, who tend to downplay the public's opinions and perspectives. These experts have institutionalised access to authoritative information and influence (Killingsworth and Palmer, 2000). The expert "thinks of the political context of 'us' and 'them', of the knowledgeable and rational experts and the uniformed and emotional public" (Hays, undated, cited in Killingsworth and Palmer, 2000). These experts are generally applied

scientists or technicians primarily interested in facts and procedures. According to Killingsworth and Palmer (2000), they require large compilations of data from which they are able to assert their authority. While preserving science's interest in inductive reasoning and the generation of data, they tend to ignore research rules of tight argumentation and the need for peer review (ibid).

Social theorists refer to this behaviour of government experts as instrumental rationality – experts seek to instrumentalise the relationship between people and the natural environment (ibid). The rhetoric of instrumentalism dominates the major documents produced by administrative government internationally and in South Africa, such as policies and EIAs. Government policy makers "shape the environment in a mode of rationality, referring legitimate discourse to the expertise of managerial environmental practices" (Berger et al., 2001: 59). While western democracy espouses a belief in democratic participation, this is "corrupted by the liberal desire for efficiency, the great goal of instrumental action" (Killingsworth and Palmer, 2000: 58).

In contrast to instrumental rationality, social theorist Jurgen Habermas put forward his notion of "communicative rationality". Habermas was committed to public policy making which reflects more fully and diversely on how actors explain and understand reality, as an alternative to "the narrow diminished world of instrumental rationality and the dominant interests of economic and bureaucratic power" (Healey, 1996: 219). This calls for communicative action involving democratic argumentation and discussion in which actors are encouraged to bring together their different views with the aim of reaching shared understandings. Communicative action forms the basis of Healey's call for democratic participation in policy making, which can lead to

> "more participatory forms based on inclusionary argumentation. By this term is implied public reasoning which accepts the contributions of all members of a political community and recognises the range of ways they have of knowing, valuing and giving meaning" (Healey, 1996: 219).

Such a reflexive or interactive policy-making approach is not without its pitfalls, however. There is a lack of empirical illustrations of how discourse analysis has been used to impact on policy-making or to bring about social or policy change (Ockwell, 2001; Jacobs, 1999). In a situation where, for example, the competing discourses are diametrically opposed (as in Ockwell's (2001) study of pro- and anti-fire discourses in Australia), it is unclear whether increased participation in the policy-making processes could overcome issues of power and

interest (Ockwell, 2001). People who imagine the world through different discourses may continue to "talk past one another" because they are unable to overcome the barriers between the different conceptual languages they use (Demeritt, 1994 in Butteriss et al., 2000; Healey, 1996).

Role-players may also be disadvantaged by their inability to present their argument in an accepted style or language (ibid). The differences in discursive power between lay people and those with technical, professional expertise therefore need to be recognised (Burgess et al., 1998). Proactive discourse managers could be employed to assist to minimise these power effects, but it will be difficult to ensure their neutrality. Many participatory policy exercises also have a strong "co-opting effect", leading to limited concessions being made but little real change taking place (Hajer, 2003: 99).

Issues related to not being able to achieve consensus due to the unmanageable diversity of role-players have also been raised (Dryzek, 2000, cited in Ockwell, 2001; Hajer, 1995). This is particularly relevant in South Africa with its culturally diverse population, and associated language, educational and economic differences. It is methodologically complex to make such inclusionary approaches work (Healey, 1996). For example, public debates relating to the chemical industry in Germany did not achieve consensus but ended in increased confusion (Hajer, 1995). Maximising honesty and openness can lead to increased antagonism. Ockwell (2001) also raises the interesting point that deliberative democracy is an anthropocentric concept, which may pose philosophical problems in terms of the representation of the interests of non-human species. This illustrates that even deliberative, interactive approaches are constrained by issues of representation and power. As Ockwell (2001: 48) asks, "what is more important, democracy or sound environmental management?", a question which could take this research along another line of debate entirely. Hajer and Kesselring's (1999) research into transport policy in Munich reveals that neocorporist negotiations were far more effective in bringing about sustainable mobility strategies than new democratic processes with wider society.

What does this mean then for bringing about improved environmental policy- and decision-making in the eThekwini municipal context? While problems have been experienced in more deliberative and interactive policy approaches, the benefits can still outweigh the difficulties. Hajer (1995) suggests that the potential problems of more interactive policy making often relate to specific institutional designs, and not as much to the idea of public deliberation itself.

Interactive policy making and debate should take place at as early a stage as possible in the policy process (Hajer, 1995; 2003). This will allow for the more inclusive definition of problems at the outset. From Hajer's perspective, reflexive institutional arrangements should not be based on pre-conceived problem definitions. Instead the process should include the construction of the problem by all role-players. In the eThekwini Municipality this includes municipal politicians and officials, civil society, business, environmental groups and NGOs.

The skills of policy makers also need to be developed to encourage and manage more participatory approaches (Myerson and Rydin, 1991; Healey, 1996; Forester, 1999). These would include gaining an improved understanding of argument and discourse in policy situations and developing argumentative skills. In the planning context of local government, Myerson and Rydin (1991) suggest that this will encourage an improved process of debate and argument, leading to greater political involvement of all role-players, and the facilitation of political change. Ockwell (2001) also suggests, drawing from Dryzek, that legitimacy can be achieved without complete consensus, as long as policy decisions have been subject to consideration and debate with all affected role-players, and represent the majority of discourses.

While the main aim of this research is to focus on illuminating the environmental discourse dynamics at play in the eThekwini Municipality, the ideas embodied in an interactive or reflexive policy making approach provide a useful starting point for critiquing the policy process followed in the eThekwini Catchments project. These ideas, and the institutional actions they suggest, align well with the strong sustainability discourse. As such they will add an important dimension to the link between the identified discourses and their institutional context.

2.8 Conclusion

This overview of environmental policy discourse and the complexities of discourse dynamics in the institutional context provides a strong theoretical foundation for this research. Hajer's discourse concepts are the key structuring elements of the analysis of environmental discourse in the eThekwini Municipality, focused on the eThekwini Catchments project. The use of Hajer's discourse analysis methodology ensures that a close link is maintained between the theoretical and practical aspects of discourse. In addition to a strong theoretical foundation, the examination of environmental discourse dynamics in the municipality requires a thorough understanding of the local institutional context. The following chapter therefore provides an overview of the institutional context of the eThekwini Catchments project.

CHAPTER THREE: CONTEXT AND CASE STUDY

3.1 Introduction

Environmental discourse in any municipality is influenced by a number of factors - by international and national legal obligations relating to development and the environment, by internal politics, policies and practices, as well as by the local political, social and economic context. However, the influence of these factors has been complicated over the past decade by dramatic political changes within South Africa. Since 1994 municipalities have been required to respond to a barrage of new legislation relating to development, the environment and municipal responsibilities, while also adjusting to new municipal boundaries and consequent institutional transformation. These changes in municipal governance have made environmental decision-making a complex, difficult, and uncertain activity. The focus of this research, the Urban Strategy Department project, "eThekwini Catchments 2002: A Strategic Tool for Planning"[1] (Diederichs et al., 2002), was therefore initiated and developed within the context of these unsettled institutional circumstances.

This chapter provides a general overview of the context of the project. It examines the economic, spatial, social and biophysical characteristics of the eThekwini municipal area, the institutional structure of the municipality, the key legislation directing municipal governance and development, and specific municipal initiatives relating to planning, the environment and development. The chapter concludes with a description of the eThekwini Catchments project, as both process and product, which provides a basis for the discussion of the research methodology in Chapter 4.

3.2 The eThekwini Municipal Area

The eThekwini municipal area is situated on the east coast of South Africa, in the province of KwaZulu-Natal. It covers an area of 2,297 km², 1.4% of the total area of the province. With a population of approximately 3 million (over 1/3 of the population of the province) and generating about 60% of the province's economic activity, the municipal area is subject to wide-ranging development pressures (eThekwini Municipality, 2003a). Durban plays a key role in the national economy as South Africa's major port city, and therefore the country's main entry and exit point for imports and exports. It is the trading gateway to the Gauteng mineral-industrial

[1] Referred to as 'the Catchments Project' in the remainder of the thesis.

complex, and to markets and trading routes in the East (ibid). Durban is also the second largest industrial centre after Gauteng, with manufacturing contributing about 30% to the local economy. Other main sectors of the economy include tourism, finance and transport (ibid). Tourism contributes about 24% to the city's economy (ibid), based mainly on the attractions of its coastline and more recently, the conference facilities provided by the International Convention Centre.

Durban's sub-tropical climate, topography, vegetation and coastal resources are major assets, not only for tourism, but also for the city's residents, business and industry (Hindson et al., 1996). The natural environment consists of a wide variety of terrestrial, freshwater and marine ecosystems (eThekwini Municipality, 2003a). The city is located in an area of high biodiversity due to its location in a biogeographic replacement transition zone (Hindson et al., 1996). In essence, it is here where the tropical subtraction zone extending from East Africa in the north meets and overlaps with the temperate subtraction zone from the Cape in the south. Fauna and flora in the municipal area therefore represent both tropical and temperate zones (ibid). Despite the apparent wealth of the city's natural assets, the natural systems of the municipal area have been dramatically transformed by human settlement and exploitation. The municipality's 1996 State of Environment Report (Hindson et al., 1996) estimated that natural areas made up only 5% of the city's area at that time, i.e. when the municipal area was 60% of its current size. It went further to say that only 1% of those natural areas were close to their original natural state. Much of the natural resource base has been permanently altered by dredging, river canalisation, infilling of wetlands, land reclamation and the construction of large scale infrastructure (ibid). The city's natural systems continue to be under extreme pressure from agriculture, industry, and commercial and residential development.

The topography of the municipal area is diverse, ranging from a flat coastal plain in the east along the Indian Ocean through rolling hills and valleys to a steep escarpment in the west. The river drainage or catchment system and the hilly topography of much of the municipal area act as constraints to development, and have determined to some degree the spatial pattern of development in the city. However, where these constraints have not been adequately taken into account, development has resulted in environmental hazards and problems, including flooding, soil erosion and siltation, with consequent high economic and social costs. Not only has the natural environment been negatively impacted on by development – Durban's communities are also at risk. In the South Industrial Basin, for example, where most of the city's industry and, in particular, the petrochemical industry is located, local communities are threatened by severe air

pollution, as well as water, land and noise pollution which impacts all basic life support systems (Hindson et al., 1996).

The legacy of apartheid and the city's spatial structure has directly influenced the way that development has impacted on the natural environment and the city's communities. The majority of the city's urban development occupies only 35% of the municipal area and is concentrated in a T-shaped axis roughly congruent with the national N3 and N2 highways (eThekwini Municipality, 2003a). Areas close to these national roads are generally well provided with infrastructural and social services, while areas on the periphery are poorly serviced. Figure 3.1 illustrates the spatial form of the city. Apartheid planning led to the emergence of a spatial form which is still "fragmented, racially structured and in which the vast majority of the poor are located on the urban periphery and the affluent in the core (Hindson et al., 1996: 23). Most of the historically black formal residential areas, and informal and peri-urban settlement, are located on the periphery, resulting in unequal and inefficient patterns of development and service provision in the municipal area (eThekwini Municipality, 2003a).

According to the city's 2000 Quality of Life Survey, approximately 23% of the city's households live in informal settlements (Urban Strategy Department, 2000). While the municipality is making great strides in housing development, it still has a housing backlog of 220 000 units, which translates to the development of approximately 16 000 units per annum over the next 10 to 15 years (Respondent 11, Housing Department, 2003). The municipality has also made considerable progress in service provision, such that 75% of all households now have "access to adequate levels of basic household services" (eThekwini Municipality, 2003a: 8). Since the establishment of the new eThekwini Municipality in December 2000, the municipal boundary now incorporates large rural areas where many communities have limited or non-existent access to basic services. For those yet to be serviced in these newly incorporated peri-urban and rural areas, as well as the city's informal settlements, the absence of basic services has led to deteriorating physical and social conditions, with associated health risk implications. This has also put the natural environment under pressure, as the poor exploit natural resources to meet their needs. A lack of adequate liquid and solid waste disposal services has led to the pollution of underground water and streams and rivers (Hindson et al., 1996).

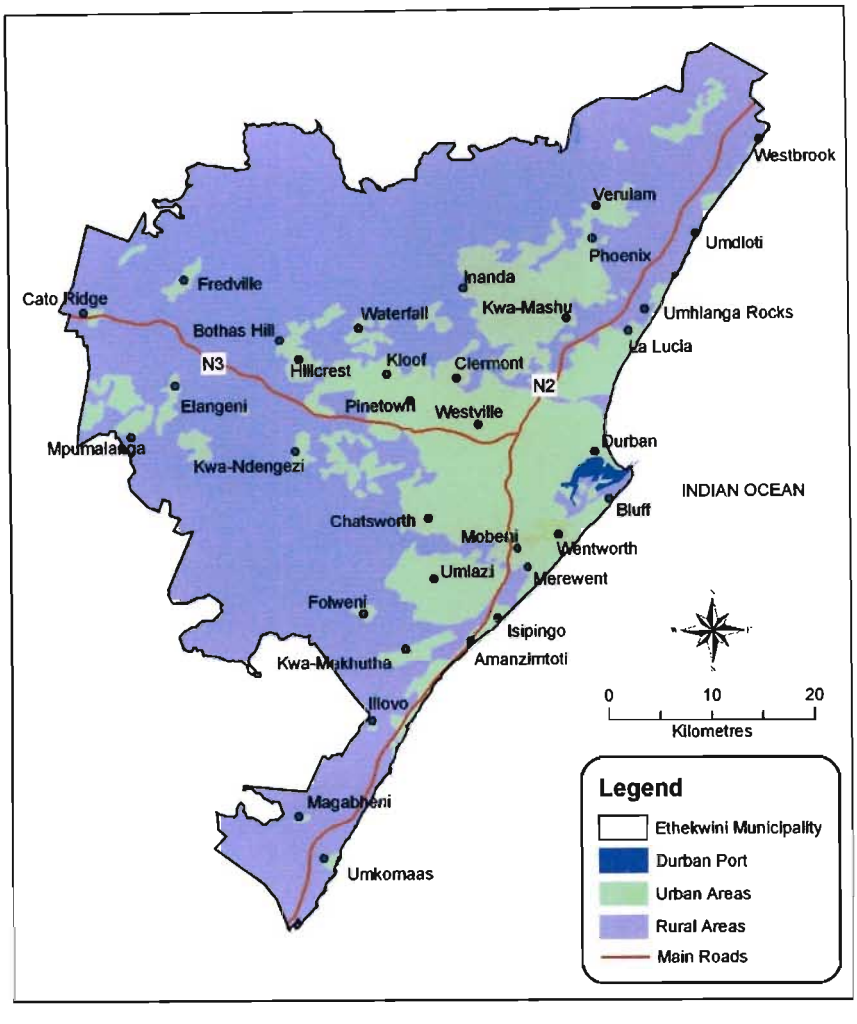

Figure 3.1 The city's spatial form

Poverty is one of the city's major challenges. Approximately 40% of Durban's households can be classified as poor, i.e. earning less than R1 834 per month (eThekwini Municipality, 2003a). While the city plays a key economic role in the country, and its Gross Geographic Product (GGP) income per person is higher than the national average, the economy is growing slowly at 1.8% per annum. Unemployment is high and worsening in the city – between 30 and 40% of the income earning age group are unemployed. There has been a net loss of jobs of 1.5% per annum since 1997 - a total of 40 000 jobs lost over the past five years (ibid). A further aspect which has exacerbated the desperate situation of the poor in the municipal area is the pandemic of HIV/AIDS. It is projected that the city's population in 2020 will remain at it current size of approximately 3 million due to the effects of HIV/AIDS. The pandemic not only affects the lives of those infected and their families, but puts considerable pressures on the community, and municipal and provincial social services.

This brief overview of the municipal area reveals a natural, social and economic environment that is under extreme pressure. As Hindson et al. (1996: Executive Summary unnumbered) argue,

> "(t)he city juxtaposes abundant resources with widespread environmental damage, green spaces with a built environment ranging from mansions to sprawling shantytowns, the very rich with the very poor, different cultures, and local governments which vary from effective to collapsed".

The critical role of the eThekwini Municipality is to seek to overcome these inequalities and problems through a new national approach to municipal governance – developmental local government – as outlined in national legislation concerning municipal responsibilities. The thinking behind this approach and the consequent institutional implications for the eThekwini Municipality are reviewed in the next section.

3.3 The eThekwini institutional context

Since 1994, municipal governance in South Africa has undergone substantial changes. In order to make municipalities more financially and administratively viable, the national government initiated a process of municipal rationalisation through the Local Government Demarcation Act (RSA, 1998a). This led to the demarcation and establishment of fewer, larger municipalities (Pieterse, 2002). In terms of revenue base, larger municipalities combined viable areas with non-viable areas, in order to provide services more effectively (ibid). Through this process, the eThekwini municipal area was demarcated to incorporate larger areas of peri-urban and rural land on the periphery of the previous municipal boundaries. The municipal area has grown in size from 300 km^2 prior to 1996, to 1366 km^2 between 1996 and 2000, to its current area of 2297 km^2 (Roberts and Diederichs, 2002). The current municipal area came into effect in December 2000, when the last municipal elections were held. It now includes six previous Local Council areas (North, North Central, South Central, South, Inner West and Outer West), the previous Umkomaas Transitional Local Council area, as well as large areas of rural and tribal land. The eThekwini Municipality is a "Category A" municipality, as described in the Municipal Structures Act (RSA, 1998b), one of six metropolitan municipalities in the country.

The key policy objective and strategic framework of government's approach to municipal government, is "developmental local government" (Parnell and Pieterse, 2002). Through the Municipal Systems Act (RSA, 2000), the functions of local government have been expanded

and transformed. The municipality is the primary agent responsible for development in the municipal area, "the major conduit for poverty alleviation, the guarantor of social and economic rights, the enabler of economic growth, the principal agent of spatial or physical planning and the watchdog of environmental justice" (Parnell and Pieterse, 2002: 82-3). This new approach to municipal governance is uniquely based on notions of sustainable democratic development at the local level (ibid). The mechanism for performing these responsibilities is the Integrated Development Plan, the strategic planning tool required of all municipalities in South Africa in terms of the Municipal Systems Act.

To facilitate the achievement of its new mandate of developmental local government, institutional transformation is underway in the eThekwini Municipality. The new institutional structure has been approved by Council, and is closely aligned with the city's IDP, to ensure the effective implementation of the IDP's sectoral plans, and to break down the fragmented "silo-based" delivery of the past (eThekwini Municipality, 2003a). By transforming the city's institutional and administrative systems to be more stable, efficient and effective, the municipal restructuring is intended to ensure "a strategically led municipality, integrated service delivery (and) outcomes based planning" (ibid: 14). The new structure is based on six functional clusters, each headed by a Deputy City Manager, with 27 associated sectoral units. The clusters are: Sustainable Development and City Enterprises; Procurement and Infrastructure; Health, Safety and Social Services; Governance; Corporate and Human Resources; and Treasury (eThekwini Municipality, 2003a). The City Manager also has four units that report directly to him: Geographical Information and Policy; Internal Audit and Performance Management; International and Governance Relations; and Ombudsperson and Investigations. See Figure 3.2 below for a detailed organogram.

While the municipality's institutional framework is now in place, the finer details of how the institution will function are still being finalised. In many sectors the municipality is still working administratively within its previous Local Council areas framework (Respondent 6, Development Planning, 2003). One of the city's main challenges is the disparities between these areas. Staff resources are still unevenly spread between areas, with the central areas being considerably better staffed. City processes, for example planning processes, also vary between the old Local Councils areas. These are now being streamlined to ensure continuity across the whole municipality. The process of transformation to merge the previous institutional structures and procedures into one functional municipal entity is therefore still underway.

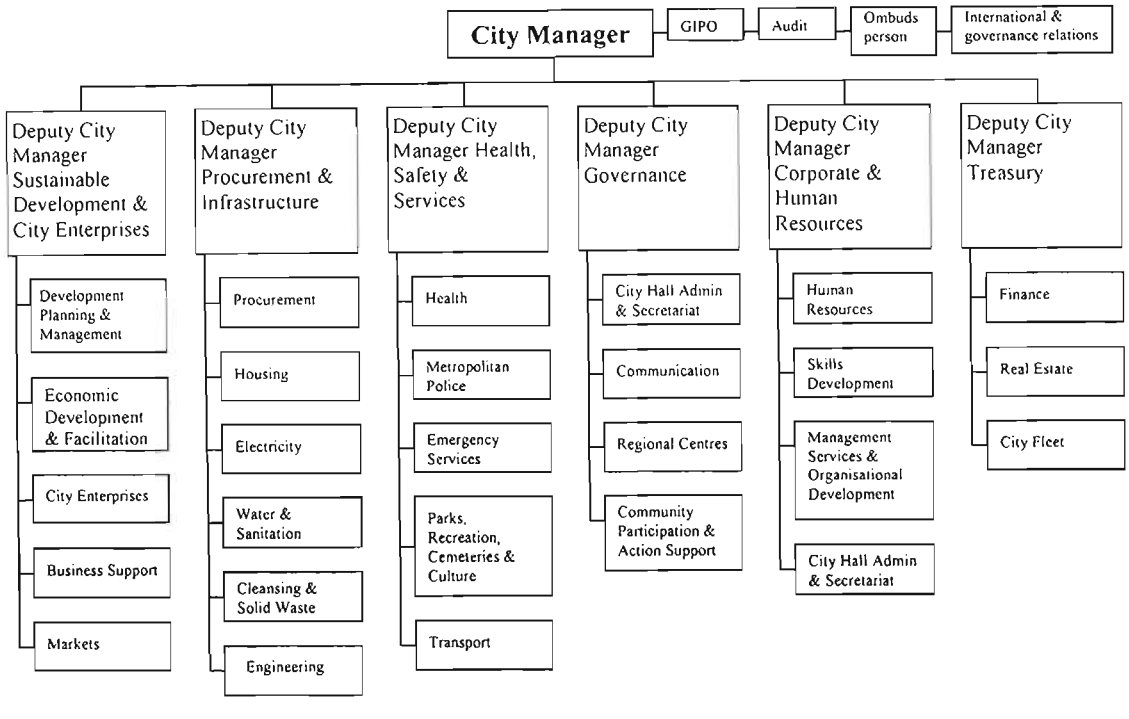

Figure 3.2 Municipal institutional structure (eThekwini Municipality, 2003a: 14)

In the period leading up to the establishment of the new municipality, substantial work was done by the city's strategic planners to investigate the demarcation of new administrative areas for the city. However, this work was never implemented at a city-wide level, as it was decided to test an Area-Based Management approach in five pilot areas first (as discussed in section 3.5.5). Consequently, the city has not been divided into separate administrative regions. However, a newly appointed Head of Regional Centres has been tasked with developing administrative service centres to bring 'local government closer to the people through one-stop shops' (Respondent 5, IDP Planner, 2003).

As provided by the Municipal Structures Act (RSA, 1998b), the elected decision-making body of the municipality is the municipal council. The eThekwini Municipal Council has 200 councillors, 100 being elected ward councillors and the other 100 representative of political parties on the basis of proportional representation (eThekwini Municipality, 2003b). An Executive Committee comprising of 9 councillors is chaired by the city's Mayor. The Executive Committee is the principle management committee of the municipality and reports to the full Council. The Council also has six supporting committees which meet at least once a month, with each councillor serving on at least one committee. These committees have certain delegated powers by which they take decisions on behalf of Council, and report and make recommendations to Council within their sphere of responsibility (ibid). The Council's

supporting committees are as follows: Tender and Contract Committee; Town Planning; Health and Safety; Economic Development and Planning; Infrastructure, Transport, Culture and Recreation; and Housing, Land and Human Resources. The municipal councillors are therefore responsible for making the major decisions on development and infrastructure in the city, with consequent social and environmental implications. However, the role of the municipal officials in environmental decision-making must not be underestimated. They play a key role in making recommendations to the Council on a range of development decisions, and in initiating policy which is ultimately approved by Council for implementation in the municipality. Thus environmental policy initiatives such as the Catchments Project play a pivotal role in environmental decision-making in the city.

3.4 The Legislative Context – Implications for Environmental Decision-making

Municipal government must act within the framework provided by national and provincial legislation in carrying out its range of responsibilities. This section outlines the key pieces of legislation impacting on municipal environmental governance, including the Constitution and municipal, land use and environmental law. This legislation is one of the key influences on municipal environmental discourse, particularly in terms of promoting EM or strong sustainability principles.

3.4.1. The Constitution

The South African Constitution (RSA, 1996) is the supreme law of the country, providing the foundation for all other legislation, and is binding on all spheres of government. Of particular significance is section 24 in the Constitution's Bill of Rights, the "environmental right":

> "Everyone has the right
>
> a. to an environment that is not harmful to their health or well-being; and
> b. to have the environment protected, for the benefit of present and future generations, thorough reasonable legislative and other measures that
>
> i. prevent pollution and ecological degradation;
> ii. promote conservation; and
> iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

While very clearly taking an anthropocentric stance towards the environment, sustainability is a key aspect of the Constitution. This has directly influenced legislation promulgated since 1996.

Also of relevance is Chapter 7 of the Constitution, which deals with local government matters. Specifically, section 152(1) states that:

"The objects of local government are –

a. to provide democratic and accountable government for local communities;
b. to ensure the provision of services to communities in a sustainable manner;
c. to promote social and economic development;
d. to promote a safe and healthy environment; and
e. to encourage the involvement of communities and community organisations in the matters of local government".

Local government is therefore required to be democratic and accountable, focused on sustainable development and service provision, the protector and promoter of environmental health and safety, while also ensuring local participation. While the Constitution provides for an enhanced role for local government, municipalities do not act in isolation (Hamann et al., 2000). Since national, provincial and local spheres of government are "distinctive, interdependent and interrelated", the Constitution promotes the concept of co-operative governance, to ensure that all spheres of government work together in "mutual trust and good faith" (RSA, 1996, 40, 41). Environmental management is shared by all levels of government and it is therefore important that the different spheres involved work closely together to avoid duplication and confusion.

3.4.2 Municipal legislation

As discussed in section 3.3, the implementation of the Local Government Demarcation Act (RSA, 1998a) and the Municipal Structures Act (RSA, 1998b), has led to substantial change in municipal governance. The Local Government Demarcation Act deals with the actual physical demarcation of municipal boundaries, through the Municipal Demarcation Board. The Municipal Structures Act details the different categories and types of municipalities, providing the framework for their establishment and regulating their internal systems and structures (RSA, 1998b). The eThekwini Municipality is a "Category A" municipality, having exclusive municipal executive and legislative authority in its area (RSA, 1996). The Structures Act defines the Category A municipality as –

"(a) a conurbation featuring –

(i) areas of high population density;
(ii) intensive movement of people, goods and services;
(iii) extensive development; and

(iv) multiple business districts and industrial areas;

(b) a centre of economic activity with a complex and diverse economy;

(c) a single area for which integrated development planning is desirable; and

(d) having strong interdependent social and economic linkages between its constituent parts" (RSA, 1998b, 2).

The Municipal Systems Act (RSA, 2000) provides the core principles, mechanisms and processes necessary to enable municipalities to undertake developmental local government (RSA, 2000: preamble). Key duties of the municipal council include: the provision of municipal services in a "financially and environmentally sustainable manner"; consultation with the community; responsibility for promoting and undertaking development; and the promotion of a safe and healthy environment (RSA, 2000, 4(2)). A key requirement of the Act is municipality's duty to develop a system of participatory governance (RSA, 2000, 16). Conditions need to be created to encourage community participation in municipal affairs including its IDP, performance management system, budget and strategic decisions relating to municipal service provision. Thus municipal legislation has a strong focus on involving the local community in governance matters.

Municipalities are required to prepare an Integrated Development Plan (IDP) to meet their Constitutional duties of developmental local government (RSA, 2000, 23). An IDP is a single, inclusive and strategic plan for the development of the municipality and guides all decisions relating to planning, management and development in the municipal area (RSA, 2000, 25 and 35). It thus plays a key role in directing municipal development in a particular manner. The Municipal Systems Act's definition of development is particularly interesting, since it is clearly influenced by sustainability principles. Development is defined as:

"sustainable development, and includes integrated social, economic, environmental, spatial, infrastructural, institutional, organisational and human resources upliftment of a community, aimed at –

(a) improving the quality of life of its members with specific reference to the poor and other disadvantaged sections of the community; and

(b) ensure that development serves present and future generations" (RSA, 2000, 1).

Chapter 25 of the Act details the core components of IDPs and the process for the development, approval and review of IDPs. An IDP must reflect the following:

(1) Council's vision for its long term development, an assessment of the existing level of development;
(2) Council's development priorities and objectives;
(3) Council's development strategies;
(4) A spatial development framework (SDF) (including basic guidelines for a land use management system);
(5) Operational strategies;
(6) Disaster management plans;
(7) A financial plan; and
(8) Key performance indicators and targets (RSA, 2000, 26).

The Municipal Planning and Performance Management Regulations (RSA, 2001) provide more detailed requirements regarding the contents of IDPs. These regulations also elaborate on the requirements for the preparation of a SDF, which needs to include: objectives that reflect the desired spatial form of the municipality; strategies and policies to achieve these objectives; basic guidelines for a land use management system; a capital investment framework; a strategic environmental assessment; the identification of programs and projects; and a visual representation of the desired spatial form. The SDF therefore unites spatial, environmental and economic aspects to provide strategic guidance for city development.

3.4.3 Land use planning legislation

Apart from the planning framework provided by the IDP and its SDF at a strategic level, municipalities continue to manage land use through a complex mix of planning and development legislation inherited from the apartheid era. Different land use management systems apply to different areas, with different procedures and standards (Ministry of Agriculture and Land Affairs, 2001). In KwaZulu-Natal, land use, development and the subdivision of land is predominantly managed through the Town Planning Ordinance (Natal, 1949) and the more recent Development Facilitation Act (RSA, 1995). In the eThekwini municipality, Town Planning Schemes prepared in terms of the Town Planning Ordinance guide development at a local level. However these schemes only apply to previously white, indian or coloured group areas, while alternate apartheid-era legislation still applies to the black township areas. The current land use planning framework is therefore fragmented and unequal in its treatment of different localities in the city, making planning administration complex and confusing. Imbalances in planning administration are also complicated by the different ways of

managing planning processes in the old Local Council areas. However, efforts are underway to streamline planning processes, so that one generic set of processes is used by all areas.

The development of new national legislation to improve planning in the country is still in process. The only planning law passed at national level since 1994 is the Development Facilitation Act (RSA, 1995). This act was promulgated as an interim measure to "bridge the gap between the old apartheid era planning laws and a new planning system reflecting the needs and priorities of the democratic South Africa" (Ministry of Agriculture and Land Affairs, 2001). The Act provides for measures to facilitate and speed up the consideration of land development and land use change applications by provincial development tribunals. While many large scale developments are submitted for approval through the KwaZulu-Natal Development Tribunal, thus sidestepping municipal planning obligations, a large proportion of land use and development applications are still handled by the eThekwini Municipality through the old legislation.

The White Paper on Spatial Planning and Land Use Management (Ministry of Agriculture and Land Affairs, 2001) recognises the need for new legislation to provide a uniform framework for spatial planning and land use management throughout the country, in both urban and rural areas. Consequently, a new national Land Use Management Bill is in the process of being drafted. Once enacted, the new Land Use Management Act will replace the DFA as well as other apartheid era planning legislation. The key principles that will underpin the new act include:

1. Sustainability - the sustainable management and use of the resources of the natural and built environment;
2. Equality – everyone must enjoy equal protection and benefits relating to spatial planning, land use management and land development actions;
3. Integration – separate and diverse elements involved in development planning and land use should be combined and coordinated; and
4. Good governance – spatial planning, land use management and land development must be democratic, legitimate and participatory (Ministry of Agriculture and Land Affairs, 2001).

While national government plans to proceed with the proposed Land Use Management Bill in 2004, delays and complications with the drafting of the Bill have lead to provincial government proceeding with the drafting of their own new overarching planning and land use legislation. When the national Land Use Management Act is promulgated, provincial governments will be able to request exemption from certain sections of the new act which overlap with new

provincial legislation. In KwaZulu-Natal, the provincial department of Traditional and Local Government Affairs is preparing provincial land use legislation suited to the specific context of the province. The eThekwini municipality is involved in this legal drafting process, which is linked to the development of its own land use management system (LUMS).

The White Paper on Spatial Planning and Land Use Management makes the point that local government is the most important sphere for decision making relating to spatial planning, land use management and land development. Building on the requirements of the Municipal Systems Act, the White Paper stresses the need for an effective link between municipal strategic planning (the IDP and SDF) and development control (the land use management system). It is therefore essential that the new provincial planning legislation provides for the development of municipal land use management systems which will be designed to carry out the intentions of the IDP and the SDF. The links between strategic planning and development control will be enhanced through ensuring that most planning and land use decisions will be made by municipalities in terms of their new land use management systems, with certain exceptions such as appeals against municipal decisions.

3.4.4 Environmental legislation

The National Environmental Management Act (NEMA) (RSA, 1998c) is the overarching environmental law in South Africa. NEMA establishes key principles for decision-making on matters relating to the environment, which apply to the actions of all organs of state in South Africa. Of particular importance is the anthropocentric focus of the principles, which is based on the environmental right in the Constitution. The first principle states,

> "Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably" (section 2(2), RSA, 1998c).

Other important principles uphold the concept of sustainable development, and promote integrated environmental management, environmental justice, equitable access to environmental resources, benefits and services, community participation and related capacity building (section 2, RSA, 1998c). NEMA consequently focuses on the management of the environment in relation to human needs in such a way that development is socially, economically and environmentally sustainable. The influence of these principles is of particular importance in this exploration of environmental discourse in the eThekwini Municipality, especially in relation to the Catchments Project approach.

NEMA promotes integrated environmental management using appropriate environmental management tools, to encourage decision-making that applies these principles. It also provides a framework for the integration of the environmental management activities of the different spheres of government (McKenzie, 2003). The Act provides for "co-operative environmental governance" by establishing a National Environmental Advisory Forum and a Committee for Environmental Co-ordination (RSA, 1998c). National departments responsible for environmental management or whose functions impact on the environment are required to prepare environmental implementation plans and environmental management plans. The purpose of these plans is "to coordinate and harmonise environmental policies, plans, programmes and decisions" of government. Municipal actions and decision-making should be informed by these plans. While local government is represented on the Committee for Environmental Co-ordination, NEMA tends to focus on the role of national and provincial government in environmental management, perhaps neglecting the key roles and responsibilities of local municipalities related to the environment (Hamann et al., 2000).

The Environment Conservation Act (RSA, 1989) is the second key environmental law in South Africa, although most of its sections were repealed when NEMA came into effect in 1998. The Act's current importance is due to its environmental regulations (R1182 and R1183 of 1997) which outline particular development activities requiring the authorisation of the relevant provincial environmental department and the associated authorisation process. While municipalities have not been delegated the authority to process these Environmental Impact Assessment (EIA) applications, they play a key role in providing comments to the provincial environmental department. The environmental regulations will be repealed once NEMA has been amended to include a similar environmental approval process. The Environment Conservation Act will then also be repealed.

Several of the municipal officials interviewed for this thesis are involved in the review of EIA applications, making use of municipal environmental policy in the review process. The EIA regulations therefore play a key role in framing environmental discourse in the municipality. However, apart from these two key environmental laws, a range of legislation governs specific areas of environmental management in South Africa, such as marine resources, forestry and agriculture. These all have relevance to municipal environmental governance. However, the only other piece of national legislation of specific relevance to this case study is the National Water Act (RSA, 1998d), discussed in section 3.4.5 below, due to its focus on catchment management.

3.4.5 The National Water Act

The National Water Act (RSA, 1998d) provides for fundamental reform of the law relating to water resources in South Africa. The key premise of the Act is that water is a national resource, owned by the people of South Africa, with the state acting as custodian of that resource (Hamann and O'Riordan, 2000). The Act has a strong social focus and promotes equitable access to water, particularly to ensure the provision of water for basic human needs (RSA, 1998d, 2). Sustainable management and use of South Africa's scarce water resources is stressed, to ensure that the growing demand for water is met. Consequently, aquatic and associated ecosystems need to be protected and the degradation and pollution of water resources prevented (ibid).

To facilitate national water resource management, the Act provides for the development of a national water resource strategy. This strategy provides the framework within which water will be managed at a regional or catchment level based on defined water management areas (RSA, 1998d). Catchment management agencies are the institutions to be established to manage water management areas. The Act's definition of a water management area (WMA) summarises this institutional framework:

> "water management area" is an area established as a management unit in the national water resource strategy within which a catchment management agency will conduct the protection, use, development, conservation, management and control of water resources' (RSA, 1998d, 1(xxv)).

The country has been divided into 19 WMAs aligned along the boundaries of major catchment areas, of which three WMAs are in KwaZulu-Natal (McKay, 2003). The Department of Water Affairs and Forestry is in the process of establishing the first Catchment Management Agencies (CMAs) for areas of key importance for water resource management. The Mvoti to Mzimkulu CMA is currently been established for the WMA which extends from Tongaat in the North to Port Edward in the South and inland to the southern Drakensberg. It therefore incorporates the whole of the eThekwini municipal area, as well as Pietermaritzburg and smaller centres along the coast and inland. The Mvoti to Mzimukulu WMA consists of ten tertiary catchments, including the Mvoti, Mgeni, Mkomazi and Mzimkulu river systems (Wilson and Associates, 2002). The Drainage and Coastal Engineering Department of the eThekwini Municipality has been involved in the CMA establishment process since the project began in late 2000.

The purpose of CMAs is to delegate water resource management to the regional level and to involve local communities (RSA, 1998d). To represent the interests of various stakeholders in a balanced manner, the Act provides for the establishment of a CMA governing board. Board membership must achieve "a balance among the interests of water users, potential water users, local and provincial government and environmental interest groups" (RSA, 1998d, 81). The initial functions of a CMA are (RSA, 1998d) –

(a) to investigate and advise on the protection, use, development, management and control of water resources in its water management area;
(b) development of a catchment management strategy;
(c) co-ordinatation of the related activities of water users and water management institutions;
(d) co-ordination with any development plan established in terms of the Water Services Act; and
(e) to promote community participation performing its water management functions.

To facilitate community participation the Act also provides for the establishment of water user associations (WUAs). Such associations operate at a "restricted localised level, and are in effect co-operative associations of individual water users who wish to undertake water-related activities for their mutual benefit" (RSA, 1998d, Chapter 8). Existing irrigation boards and water control boards for stock watering are being restructured as WUAs. The Act is not clear on the relationship between WUAs and their appropriate CMA (Hamann and O'Riordan, 2000). However, the Act considers WUAs to be water institutions and therefore may be delegated water management functions by the CMA if necessary.

Since 1997, the Department of Water Affairs and Forestry has also promoted the establishment of Catchment Management Forums (CMFs), voluntary organisations focused on water resources and related issues for particular sub-catchments (Wilson and Associates, 2002). In the Mvoti to Mzimkulu WMA, 16 CMFs have been established, a critical part of developing the stakeholder participation process in setting up the CMA. An example is the Mdloti CMF which was formed to address problems such as: water quality, soil erosion, wetland protection, solid waste disposal, pollution, eradication of alien plants and protection of indigenous vegetation (ibid). Membership of the CMF includes tribal authorities, local farmers, WUAs, the eThekwini Municipality, Umgeni Water and the Institute of Natural Resources. CMFs have played a critical role in building local capacity and involvement in water management. The potential exists for CMFs to undertake certain CMA functions particularly suited to the local level, such as resource protection and monitoring.

This review of national legislation relating to municipal governance, planning and the environment gives an indication of the legislative influences on environmental discourse and practice in the eThekwini Municipality. The chapter next considers municipal planning, development and environmental initiatives which have been framed by national legislation, but which also have effects on municipal environmental discourse.

3.5 Municipal Planning, Development and Environmental Initiatives

A number of key municipal initiatives, of strategic importance to development in the municipal area, have been underway in the eThekwini Municipality in the past three years. These include the city's Long Term Development Framework, Integrated Development Plan, Spatial Development Framework and Area-Based Management initiative. A new Land Use Management System is being developed to streamline land use planning in the municipal area. Several key environmental initiatives have also been undertaken, such as the city's Sustainability Management System and the Environmental Services Management Plan. Lastly, the city's approach to catchment management has important implications for environmental management. All of these initiatives together impact on environmental discourse and practice in the municipality, and have particular relevance to the Catchments Project.

3.5.1 The Long Term Development Framework

The Long Term Development Framework (LTDF), approved in 2001, is a twenty year plan that lays the foundation for democratic and developmental local government in the eThekwini Municipal area (eThekwini Municipality, 2001b). The LTDF provides a framework for the Municipality's five year Integrated Development Plans, allowing for continuity between each IDP cycle (eThekwini Municipality, 2003a). An important element of the LTDF is the city's vision statement:

> "By 2020 the eThekwini Municipality will enjoy the reputation of being Africa's most caring and liveable city, where all citizens live in harmony. This vision will be achieved by growing its economy, meeting people's needs so that all citizens enjoy a high quality of life with equal opportunities, in a city that they are truly proud of" (eThekwini Municipality, 2001b: 4).

To achieve this vision, the LTDF aims to achieve balance in three key areas: meeting basic needs, strengthening the economy, and building people skills and technology. Of special interest is how the LTDF's vision makes no explicit reference to the natural environment, instead focusing on the social and economic development of its citizens. In contrast, the city's

IDP (completed some two years later under a new Municipal Manager) is strongly founded on the principle of sustainability, as discussed in the following section.

3.5.2 The Integrated Development Plan

The eThekwini Municipality's revised Integrated Development Plan (IDP) for 2003 to 2007 was adopted by Council in June 2003. To achieve its vision, the IDP presents a strategy which aims to ensure that all its actions "contribute to sustainable development" (eThekwini Municipality, 2003a: 6). Chapter Two of the IDP, titled "Our City's Sustainable Development Strategy", elaborates on the city's strategy for the next five years. The concept of sustainability therefore underpins the implementation of the IDP, as stated in this chapter,

> "We contend, in this revised IDP, that sustainability is not just about environmental protection. In essence sustainability is about realising good change on all fronts – it has as much to do with rising levels of income and having a clean supply of water as it does with environmental protection of natural areas. eThekwini's sustainable development is therefore about consciously building sustainability into the ways we promote economic development, provide infrastructure and services, manage our city's finances, involve citizens in decision making, and protect our threatened ecological spaces. The balancing of social, economic and environmental needs of eThekwini will emphasise the efficient use of all our resources and therefore ensure that all forms of development occur within the carrying capacity of our natural surroundings" (ibid: 6).

Building on the key focus areas of the LTDF, the IDP outlines eight strategies that will drive city action in the next five years:

1. Creating sustainable economic growth and job creation, as well as building strong and vibrant local economies;
2. Regenerating existing residential areas to ensure higher quality of life for all citizens;
3. Balancing new development with renewal and maintenance;
4. Mainstreaming our co-ordinated responses to crime, HIV/AIDS and poverty alleviation;
5. Focusing on integrating delivery to maximize impact on job creation and poverty;
6. Developing a financial strategy to balance development expenditure with a strategy to grow income;
7. Ensuring that local government is accountable, accessible and aligned; and
8. Maintaining the ecological integrity of the City

(eThekwini Municipality, 2003a: 11-13).

Priority municipal programmes have been identified to implement these strategies, and a number of institutional changes are underway to bring the municipality in line with the IDP. Major institutional initiatives include the development of the six new organisational clusters, the Area-Based Management approach (discussed in 3.5.4 below), partnerships with a range of governmental, community and business actors, and the development of a new performance management system. The IDP's six strategic plans are aligned with the six new organisational clusters, and outline how the IDP's vision is to be achieved in the next five years.

The plan of most significance to this research is the Planning and Environment Plan, which is the responsibility of the Development Planning and Management Unit in the Sustainable Development and City Enterprises Cluster. The strategic purpose of this plan is to address the city's "development challenges through the spatial restructuring of the metropolitan area" (eThekwini Municipality, 2003a: 20). Its key aspects include the Spatial Development Framework, the Land Use Management System, rural development, Area-Based Management, environmental policy co-ordination and implementation, environmental impact assessment and information co-ordination, natural resource planning and management, and coastal development and management. The aspects of relevance to the case study project are covered in the sections below.

The other plans which have most bearing on the case study project are the Service Delivery Plan and the Community Service Plan. The Service Delivery Plan relates to the provision of basic household services and the provision and maintenance of sustainable bulk infrastructure (ibid: 25). The implementing units include Housing, Electricity, Water and Sanitation, Cleansing and Solid Waste, Engineering – which includes the Drainage and Coastal Engineering Department – and Transport, which all fall under the Procurement and Infrastructure Cluster. The Community Service Plan relates to health service provision, crime prevention, and other social services including recreation and parks, and falls within the ambit of the Health, Safety and Social Services Cluster.

3.5.3 The Spatial Development Framework

A key element of the IDP is the Spatial Development Framework (SDF), as required in terms of section 26 of the Municipal Systems Act (RSA, 2000). The SDF represents the spatial development goals of the municipality in the form of a broad and flexible framework, while at the same time providing clarity to decision-makers and the private sector (Ministry of Agriculture and Land Affairs, 2001). The eThekwini Municipality defines their SDF as "the

plan or map which suggests the appropriate location and form of physical development and investment to promote desired outcomes" (eThekwini Municipality, 2002b: 1). This definition is substantially narrower than the detailed definition provided in the Municipal Planning and Performance Management Regulations (RSA, 2001).

In essence, the eThekwini Municipality's SDF is the spatial expression of the LTDF and the IDP, and is intended to reshape the city's spatial form to bring about more equitable, efficient and sustainable development (eThekwini Municipality, 2002b). The SDF guides investment and activity to best "promote economic generation potential; maximise opportunities for the poor; promote accessibility; minimise the cost of physical expansion; ensure that people are well located; (and to) promote a sustainable supply of environmental services" (eThekwini Municipality, 2003b: 20). Based on settlement density, infrastructure capacity and the structure and limitations of the natural landscape, the SDF divides the city into the urban core, urban periphery and rural periphery (eThekwini Municipality, 2002b). The urban edge, which coincides with the edge of the urban periphery, denotes the area beyond which urban-level services should not be provided, in the interests of sustainability. This relates to the economic efficiency aspect of sustainable development. The SDF also identifies key investment points and road networks to direct public investment and encourage private investment, and to promote public transport and accessibility (ibid). The SDF is shown below in Figure 3.3.

A number of key actions are still required to complete the SDF, including final determination of the boundaries of the urban core, urban periphery and peri-urban areas; the establishment of spatial policy and land use management frameworks; and political approval by the Council (eThekwini Municipality, 2003a). It is worth noting that the current SDF is not supported across the board. For example, the implications of the urban edge in terms of lower levels of service provision in outlying areas is a contentious issue in certain quarters (Respondent 1, Urban Strategy Department, 2003).

3.5.4 Area-Based Management

The city's Area-Based Management (ABM) programme was initiated to test new ways of promoting responsive developmental government (eThekwini Municipality, 2003a). ABM originates from municipal deliberations during 2000/2001 relating to the establishment of administrative areas in the city. Originally the whole municipal area was to be divided up into 28 to 32 administrative areas (Respondent 5, IDP, 2003). However, the city's thinking had changed by the time European Union funding became available for the ABM programme.

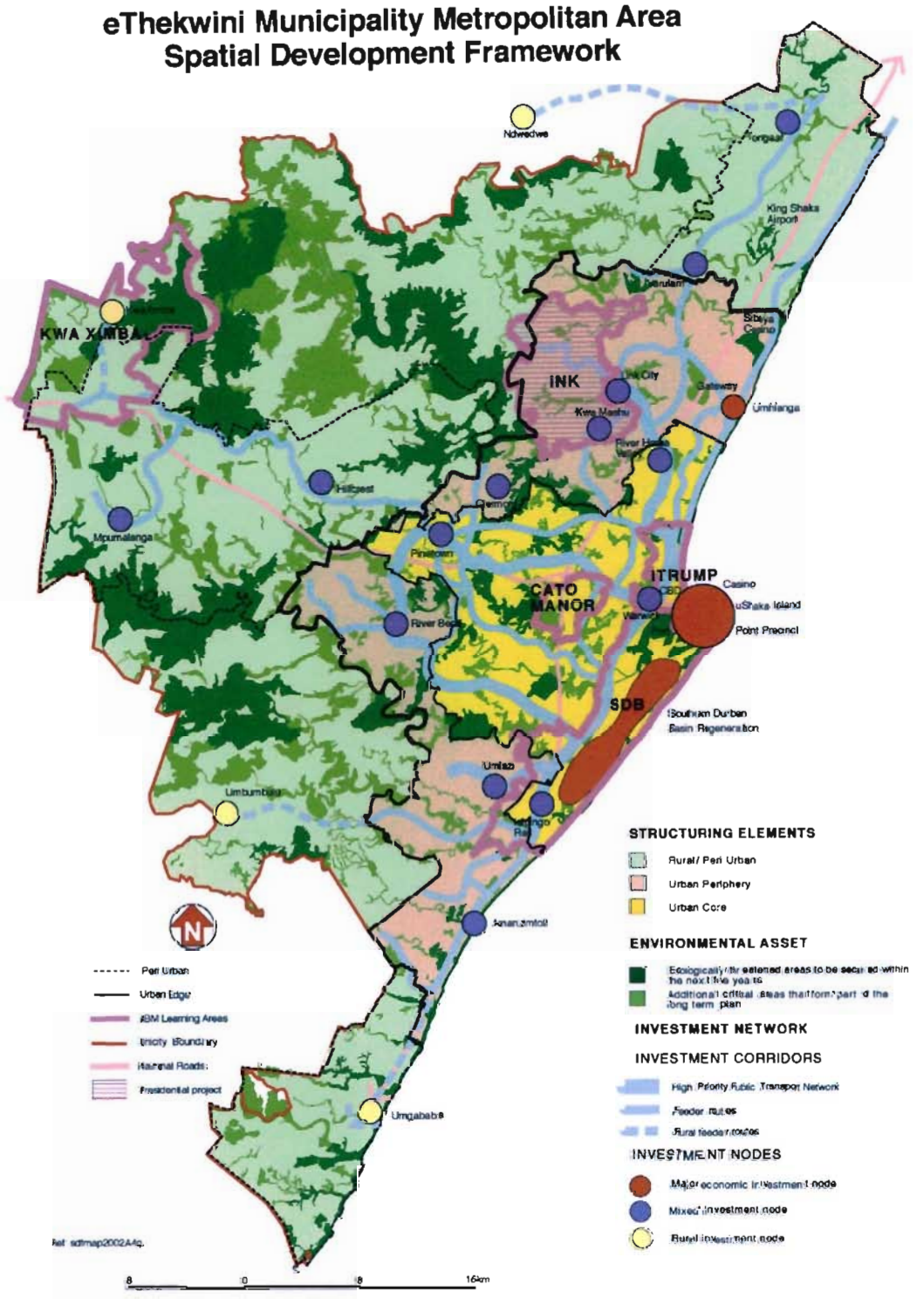

Figure 3.3 eThekwini Spatial Development Framework (eThekwini Municipality, 2002b)

It was decided that the funding would be most effectively used to pilot the ABM approach in five areas first, to test different ABM models. The pilot areas, as shown on the SDF map (Figure 3.3 above), are: Inanda-Ntuzuma-KwaMashu (INK) (a Presidential Lead Project area), the South Industrial Basin, Cato Manor, the Inner eThekwini renewal and Urban Management Programme area, and KwaXimba located on the rural periphery. As stated in the Business Plan for the INK ABM area, "(t)he purpose of the (ABM) programme is to contribute to the municipality's goal of improving governance, urban management and development, and to strengthen the municipality's capacity to implement, oversee, monitor and learn from the five pilot areas" (eThekwini Municipality, 2002c). The focus of ABM therefore, is to use these five learning areas to promote close co-operation with citizens in the delivery of services, and for Council to learn and improve on its way of doing business (eThekwini Municipality, 2003a). It also allows for integrated, holistic development and service delivery, and focused investment in the learning areas. The ABM programme is still in the process of being established. It will be monitored on an annual basis and its outcomes assessed in June 2007.

3.5.5 Land Use Management System

Characteristic of all cities in South Africa, land use in eThekwini is still managed through disparate pieces of legislation, authorities and procedures inherited from the apartheid dispensation. However, the municipality is in the process of developing a new Land Use Management System (LUMS), working closely with the provincial Department of Traditional and Local Government Affairs as the new provincial land use legislation is developed. The IDP outlines a number of key actions to facilitate the development of the LUMS. These include measures to improve land use planning and management in the interim, such as the standardisation and streamlining of current land use planning procedures across the whole municipality and the preparation of land use schemes for areas without schemes (eThekwini Municipality, 2003a).

The LUMS design and implementation process first involves developing strategic, management and operational frameworks. The SDF provides the strategic framework for the city, which will support a hierarchy of plans at a regional and district level. The management framework incorporates how the LUMS will perform institutionally, and therefore relates to procedures, decision-making, community participation, information systems and general management of the system. The operational framework consists of the land use schemes and their associated regulations - the practical tools to manage the system on a daily basis. Once these frameworks

are in place, the LUMS development process will proceed with translating the existing schemes into Land Use Schemes, the development of planning by-laws, associated training, and the establishment of a LUMS performance management system (ibid).

3.5.6 Environmental Planning and Management initiatives

The core function of the Environmental Management Branch, located in the Development Planning and Management Unit, is the development of a Sustainability Management System (SMS) for the municipality (Environmental Management Branch, 2003). This initiative has been developed within the framework of a range of environmental projects falling within the city's Local Agenda 21 (LA21) programme. LA21 has been the key driving force behind all the environmental initiatives undertaken by the Environmental Management Branch since the Branch was first established in 1994 (Roberts and Diederichs, 2002). When the SMS project was initiated in 2000, it was framed as an Environmental Management System based on the ISO 14001 standard for Environmental Management Systems. However, it was later expanded to encompass broader sustainability issues. Now that the corporate responsibility for sustainable development in the city has been allocated to the Geographical Information and Policy Unit (GIPO), the project may refocus on environmental issues alone (Respondent 3, Environmental Management Branch, 2003). The appropriation of broader sustainability principles by city management, in particular in the IDP, has led the Environmental Management Branch to revert back to its original focus on the biophysical environment. This includes handing over the assessment of most EIAs to the city's planners. The Environmental Management Branch will now focus on issues with a clear biophysical focus, such as biodiversity management (ibid).

The city's 1998 Metropolitan Environmental Management Policy provided the framework for the SMS initiative, and was used as a guide to assess the sustainability of municipal policies, activities and decision-making (Roberts and Diederichs, 2002). Based on this review process, certain key interventions were identified to improve the municipality's sustainability performance. A number of projects are now underway aimed at encouraging sectoral municipal departments to implement the Environmental Management Policy in their realm of responsibility (Respondent 3, Environmental Management Branch, 2003). The IDP also outlines key actions required to continue to develop and implement the SMS, for example, the development of sustainability indicators, an eco-procurement programme and associated capacity and resources.

Over the past decade, open space planning has been one of the Environmental Management Branch's priority areas of focus. This approach to environmental management gives particular attention to open spaces and their role as providers of environmental resources and services, drawing on resource economics concepts. The most recent policy document reflecting this approach is the municipality's Environmental Services Management Plan (ESMP) which provides "a framework for the utilisation, protection, development and management of the environmental resources and assets within the city" (eThekwini Municipality, 2001a: i). The ESMP builds on previous municipal open space planning initiatives, including the 1989 Durban Metropolitan Open Space System (D'MOSS) and the D'MOSS Framework Plan (Durban Metropolitan Council, 1999). While the main reason for the ESMP was to extend the previous open space planning work to include the new areas of the municipality, it has also been informed by new concepts relating to the environmental services provided by open spaces (Environmental Management Branch, 2003).

Four key concepts underpin the ESMP (eThekwini Municipality, 2001a):

- Open space assets – Open space assets are the unsealed, or vegetated, open spaces in Durban, excluding agricultural land and rural settlements. These open spaces include terrestrial, freshwater, estuarine, coastal and marine ecosystems, each consisting of different vegetation and habitat types. The total open space asset within the municipal area amounts to 75 561ha, approximately 33% of the total municipal area.

- Catchment Management and Planning – The ESMP explicitly recognises the benefits associated with planning and managing development and resource utilisation on a river catchment basis. A catchment approach acknowledges the central role that natural environmental systems and resources play in ensuring the long term sustainability of development. Since river catchments are "a fundamental element in the organisation and functioning of natural (eco) systems and a primary structuring element for urban land use and settlement patterns", they are a logical basis for managing resource use and development (eThekwini Municipality, 2001a: 13).

  The ESMP argues that catchment planning is useful for facilitating:

  (1) Integration of various scales of planning;

  (2) Translation of policy into spatial and physical development management strategies and/or tools;

(3) Integration of various planning sectors, such as institutional, land use, environmental and economic development planning;
(4) Identification of the spatial and physical relationships between communities, and identification of integrated strategies to solve common problems; and
(5) A practical response to issues facing stakeholders who share a common resource base (eThekwini Municipality, 2001a).

A total of 18 river catchments are located either wholly or partly in the eThekwini municipal area (see Figure 3.4). Each catchment has different locational, physical, economic, social and spatial characteristics, and different quantities and qualities of open space asset. The ESMP maps and quantifies the open space asset of each catchment according to different vegetation or habitat types. It also outlines the key management actions required to respond to existing and proposed land uses and infrastructure requirements, and to maintain existing environmental assets, on a catchment by catchment basis.

- Environmental services – The natural ecosystems in open space contain resources and perform functions that provide goods and services to the environment and the greater community. These services are vital to maintain an acceptable quality of life and to meet the basic needs of communities. Environmental services include: climate regulation, water regulation, erosion control, soil formation, waste treatment, biological control, production of food and natural products, recreation and cultural uses. Different ecosystems or types of open space have varying abilities to supply these services. Different land uses also exert a variety of demands on environmental services.

  Using the tool of resource economics, an evaluation of the environmental services provided by the municipality's open space assets has been calculated at R3.4 billion per annum. The ESMP argues that "the loss or inappropriate management of the city's open space assets will result in a decline in residents' quality of life, unaffordable replacement costs of environmental services and the loss of Durban's international and local tourism assets" (eThekwini Municipality, 2001a: v).

- Open space system design – To ensure that open space assets continue to provide environmental services in the long-term, the open space system needs to be designed to maximise and maintain the ecological viability of the municipality's ecosystems. The ESMP classifies ecosystems as functional, partially functional or isolated. A key role of all

ecosystems is to function as corridors through which energy, water, nutrients, plants and animals can flow through and to different parts of the municipal area.

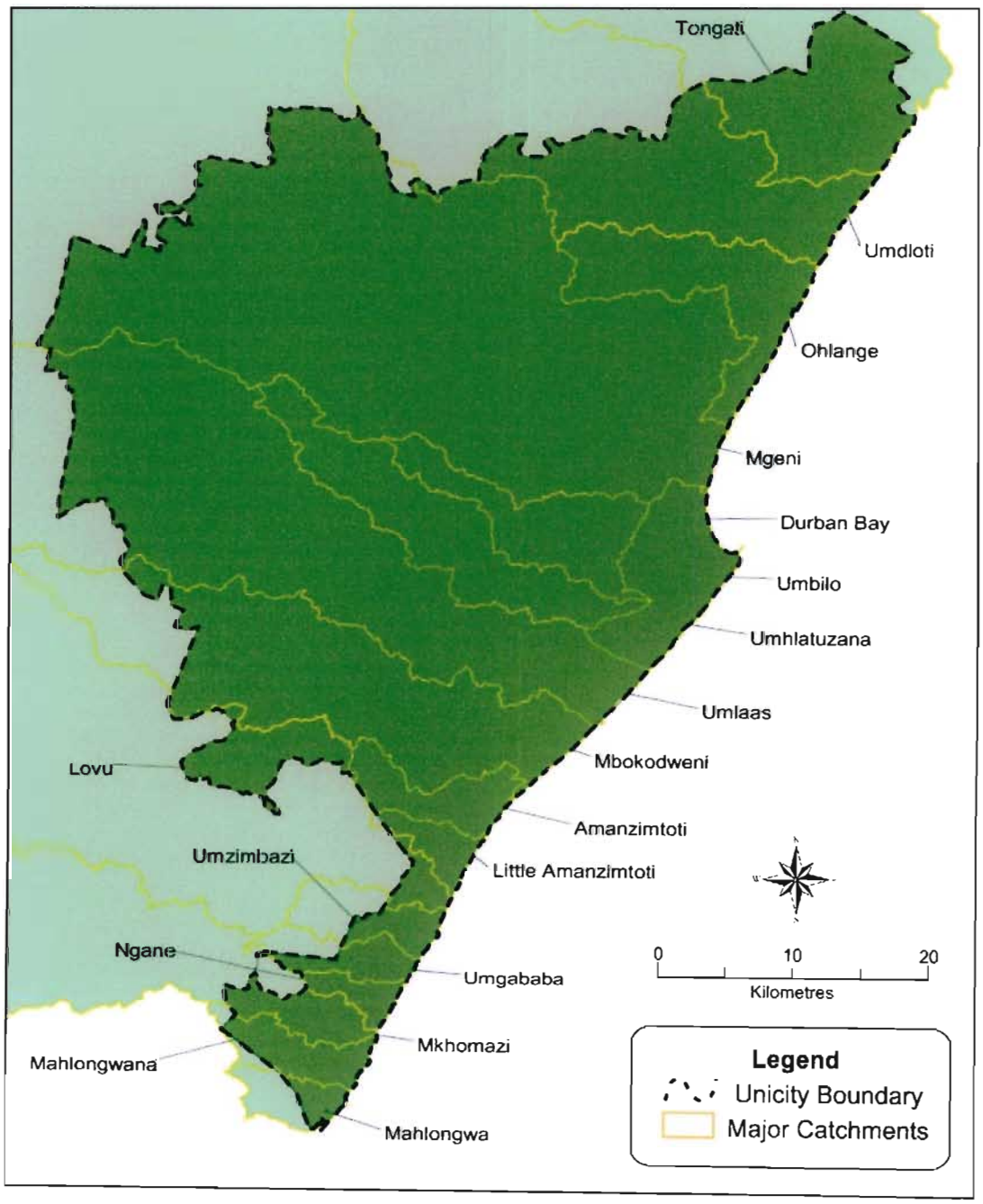

Figure 3.4 Catchments in the eThekwini Municipal Area (adapted from Diederichs et al., 2002: 6)

In order to secure the environmental services delivered by open space assets, the ESMP promotes environmental services management strategies that should focus on:

- Effective management of the open space asset;
- Integrated management of the surrounding land uses and activities that impact on the open space asset – this includes the incorporation of environmental issues and guidelines into LUMS; and
- Appropriate institutional arrangements with the mandate and capacity to manage and implement open space planning and environmental management initiatives. The ESMP argues that environmental management should be the responsibility of all municipal departments and stakeholder groups in the municipal area. To guide and co-ordinate the activities of all stakeholders, the ESMP recommends the establishment of an entity to "assist, monitor and guide local, catchment or area-based environmental initiatives"; the creation of catchment forums or other area-based entities with the necessary stakeholder participation; and the facilitation of effective partnerships between role-players (eThekwini Municipality, 2001a: v).

While the ESMP promotes the involvement of all stakeholders including the local community in environmental management, it should be noted that the Environmental Management Branch still tends to focus on the acquisition of land identified as critical open space, as its main approach to manage the city's open spaces (Respondent 15, Consultant, 2003). A community approach to environmental management is part of the city's catchment management strategy.

3.5.7 Catchment Management

The municipality's Drainage and Coastal Engineering Department is responsible for stormwater management in the city. The Department has been closely involved in the DWAF process to establish the Mvoti to Mzimkulu Catchment Management Agency (CMA). In order to align itself with the CMA and to promote catchment management in the municipal area, the Department is in the process of restructuring itself to provide for a separate Catchment Management Branch (Drainage and Coastal Engineering Department, 2003). Since the new CMA does not wish to create an unnecessary bureaucracy, it is intended that many of its functions will be out-sourced to existing institutions such municipalities and water boards through co-operative agreements (Wilson and Associates, 2002). Certain CMA functions could therefore be undertaken by this new branch.

The proposed functions of the Catchment Management Branch include: liaison with the CMA, co-ordination of catchment management in the municipal area, co-ordination with environmental and land use departments in the municipality, pollution monitoring, public education relating to stormwater systems, alien plant eradication and sandwinning (ibid). The preparation of catchment management plans will fall under the Strategic Planning, Infrastructural Management, Technical Support and Policy Branch. This Branch will also be responsible for floodline determination and the preparation of master drainage plans. The Department is in the process of undertaking 1:100 and 1:50 year floodline studies for the whole municipal area.

The importance of catchments has not only been recognised by the Drainage and Coastal Engineering Department. An Urban Strategy Department project completed in 2000 used catchments as the framework for informing planning and development in the Umdloti-Tongaat area of the north coast (Durban Metropolitan Council, 2000). The report argues that "(t)he catchment provides a practical and understandable management unit that relates to the capacity and functioning of natural systems, but is also a unit than can foster social integration on the basis of common interest ... and provide an effective means of monitoring the outcome of development and the expenditure of public funds" (ibid: 89). The report provides catchment management guidelines for each of the micro-catchments identified in the study area. However, the value of a catchments approach in municipal planning did not end here. The following section explores how the concept of the catchment as a management unit was appropriated by a wide range of municipal officials, leading ultimately to the initiation of the Catchments Project.

3.6 Case Study – "eThekwini Catchments 2002: A Strategic Tool for Planning"

The socio-economic, legal and institutional context of the eThekwini Municipality, as described in the previous sections, played a key role in how the Catchments Project was initiated and developed. The analysis of the city's environmental discourse in relation to the Catchments Project will illustrate the importance of these contextual factors. This section moves on to describe the Catchments Project. It first provides a background to the project, and describes the project process and terms of reference. The conceptual basis of the project is then explored, followed by the project methodology (the Strategic Catchment Assessment process), and the outcomes of the project, in the form of environmental status quo indicators. The section concludes with a discussion of the implications for planning and development in the city, as identified in the report in response to the indicator results.

3.6.1 Project background

The origin of the eThekwini Catchments project in early 2001 was closely linked to the institutional changes taking place in the municipality at the time. The ideas behind the project were being debated at least a year before the project was initiated, in the period leading up to the establishment of the new eThekwini Municipality in December 2000. From about the mid-1990s[2], a Transformation Office had been set up by the Municipal Manager, tasked with the management of the institutional transformation of the municipality, including the preparation of the Integrated Development Plan. As part of the IDP process, a Spatial Theme Group was established to provide strategic direction on the Integrated Development Plan, and more specifically, its Spatial Development Framework. The Spatial Theme Group was convened and managed by the Urban Strategy Department (USD[3]), the department broadly responsible for advising the Council on strategies to promote integrated development in the city, particularly relating to spatial restructuring (Urban Strategy Department, 2002). Membership of the group consisted of the following departments: USD, Development Planning and Management (responsible for land use planning and thus the LUMS programme), Environmental Management, Housing, Economic Development, Drainage and Coastal Engineering Department, Water, Wastewater and Traffic and Transportation.

At least a year before the new municipality was established, the Spatial Theme Group was tasked with developing potential administrative regions or areas for the newly demarcated municipal area. Various options were developed, including regions based on planning unit boundaries, river catchment boundaries, ward boundaries, or a mix of boundary types. The concept of using river catchments as administrative boundaries for the city had emerged from a number of quarters. Firstly, the Environmental Management Branch's Environmental Services Management Plan (ESMP) suggested that catchments were useful spatial units for environmental management (Respondents 3 and 4, Environmental Management Branch, 2003). Secondly, a recent USD project used catchments as a unit for managing development at a micro-level in the coastal zone on the North Coast (Durban Metropolitan Council, 2000; Respondent 2, Urban Strategy Department, 2003; Respondent 15, Consultant, 2003). Thirdly, the National Water Act's provision for the establishment of catchment management agencies was also a key factor. By using administrative boundaries based on catchments, linkages and integration with

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[2] Municipal officials were not able to provide an exact date.

[3] The Urban Strategy Department has recently been renamed the Geographical Information and Policy Unit. However, since 'Urban Strategy Department' was the name used by respondents during all interviews, for practical purposes the old name is used in this thesis. Similarly, other departments' names are to be changed shortly in line with the new institutional structure, but their current names will be used here.

the CMA could be achieved (Respondent 4, Environmental Management Branch, 2003; Respondent 2, Urban Strategy Department, 2003). There was strong support for the use of catchment boundaries among the members of the Spatial Theme Group.

Politically, however, the demarcation of regions according to catchment boundaries had limited feasibility. This was partly due to the city councillors' insistence that ward boundaries be used in defining areas (Respondent 7, LUMS, 2003; Respondent 5, Integrated Development Planning, 2003). Substantial work was done by the Spatial Theme Group in defining between 28 and 32 regions and their boundaries, using a mix of catchment and ward boundaries. Ultimately, however, this work was overtaken by institutional dynamics in the city (Respondent 5, Integrated Development Planning, 2003). The demarcation of regions was linked to deliberations on Area-Based Management (ABM). As the city's thinking relating to ABM unfolded, it was decided that instead of using the ABM approach in the 28 to 32 areas that had been defined, it would be best to pilot the ABM approach in five areas first, as outlined in 3.4.4 above (ibid). Consequently, the work of the Spatial Theme Group has been set aside and the city has yet to be divided into administrative regions. The Spatial Theme Group continued to operate for a year after the eThekwini Municipality was established, and was disbanded by the end of 2002 (Respondent 1, Urban Strategy Department, 2003).

3.6.2 Project process and terms of reference

Early in 2001, USAID funding was made available to the Transformation Office for five different projects linked to the IDP. One of these projects was for an 'Environmental Strategic Assessment'. Since the Transformation Office did not have sufficient staff to manage all these projects, it was decided that this project should be managed by USD, although it should remain closely linked to the IDP. During the deliberations of the Spatial Theme Group around area management boundaries, and particularly the use of catchment boundaries, USD had become frustrated with the lack of environmental information relating to the municipal area. This project was therefore framed in such a way as to gather environmental information on a catchment basis both to inform these discussions and spatial and strategic planning more generally in the municipality (Respondent 1, Urban Strategy Department, 2003; Respondent 15, Consultant, 2003).

Due to the environmental and catchment basis of the project, USD approached Environmental Management to assist with the project management and partial funding of the project. Ultimately, however, the project was wholly managed and funded by USD through USAID,

even though the initial catchment-based concepts and ideas behind the project originated from the Environmental Management Branch (Respondents 3 and 4, Environmental Management Branch, 2003; Respondent 15, Consultant, 2003). The project consultants were appointed on 30 March 2001. They were predominantly the same team of consultants appointed to develop the ESMP, which was completed in June 2001.

In the project terms of reference, the key project tasks were outlined as follows (Urban Strategy Department, 2001):

1. Develop a process/procedure for integrating catchments into spatial planning. Assess current planning process and identify appropriate areas/mechanisms of intervention for integrating a catchment-based approach.
2. Develop a technical approach for assessing catchments' roles in economy, society and environment.
3. Hold a stakeholder meeting for city planners to assess and build capacity around the technical approach.
4. Identify information requirements for implementation of catchment based planning – with associated technology and skills.
5. Apply the approach to all municipal catchments to provide an initial assessment of catchment characteristics.

The Spatial Theme Group meetings, held approximately twice a month, were used as the core forum to involve municipal staff in the project. The project was therefore aimed at key spatial and strategic planners in the city. When necessary, interim reports were sent out to the relevant municipal departments for comment. The consultants also met with relevant departments individually when they needed to gather specific information. USD held project team meetings on an ad hoc basis with the consultants to manage the project progress. In January 2002 the consultants submitted an interim report outlining the project approach and methodology, and a draft of the final report was submitted in June 2002. Although the project was intended to be completed in five months (i.e. by 31 August 2001), it took much longer to finalise. This was due to a number of factors, mostly linked to difficulties in obtaining information, the uncertainty and complexity surrounding municipal restructuring, as well as poor attendance at meetings by overstretched municipal staff (Respondents 1 and 2, Urban Strategy Department, 2003; Respondent 13, Consultant, 2003). The final outcome of the project was the report, "eThekwini Catchments 2002: A Strategic Tool for Planning"[4] (Diederichs et al., 2002), presented to

[4] Referred to as 'the Catchments Report' in the rest of the thesis.

municipal staff at a meeting on 20 November 2002. The consultants specifically chose to produce a colourful report in A3 format, and with limited text, to encourage its ease of use and accessibility. Figure 3.5 below illustrates the project process and the key role-players involved.

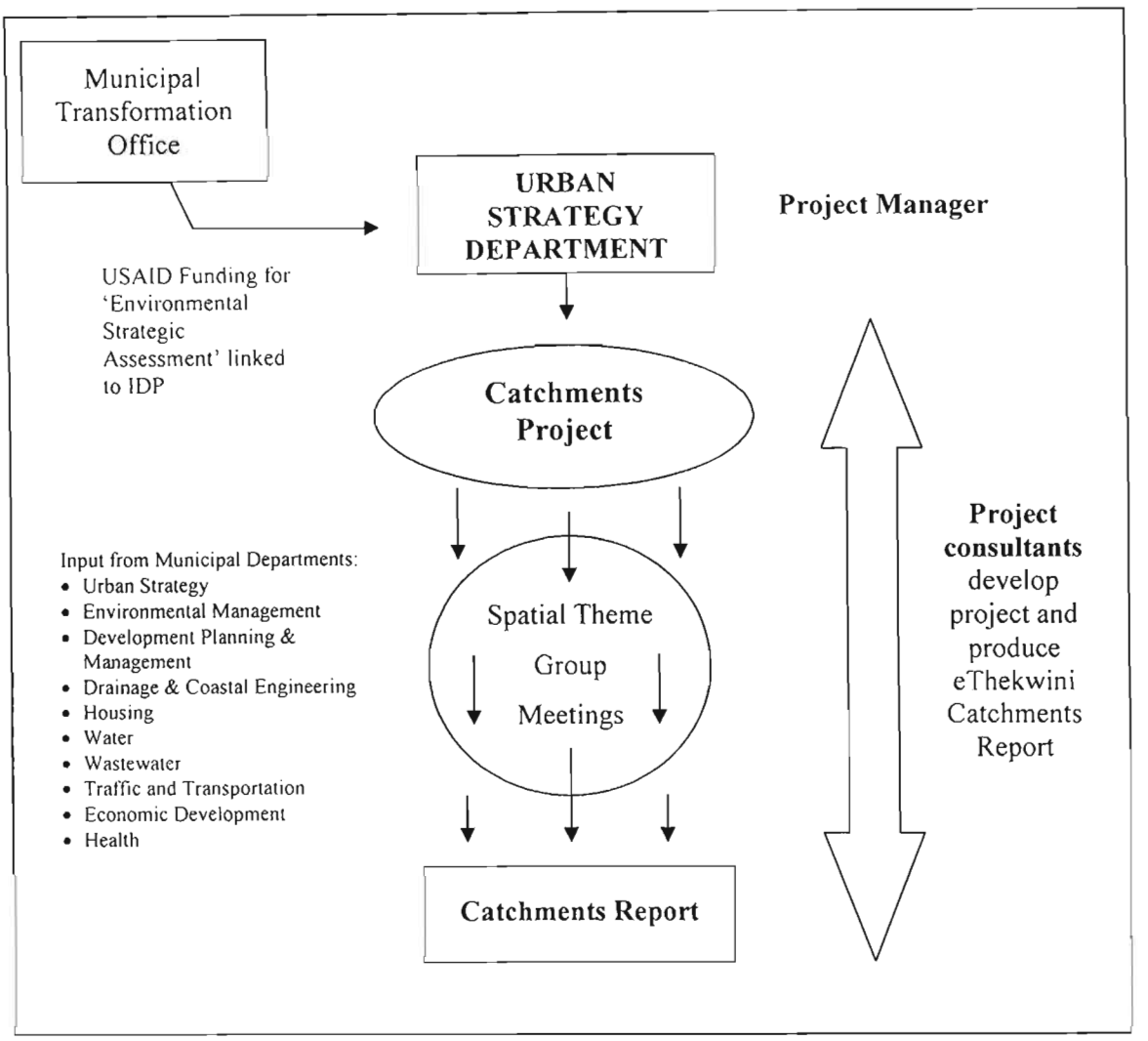

Figure 3.5 Catchments Project process and role-players

The project approach taken by the consultants was an attempt to address two issues - firstly, to provide a workable process to guide planners towards sustainable development, and secondly to provide environmental information to inform planning decisions (Diederichs et al., 2002). To do this, the consultants first developed a generic Strategic Catchment Assessment Process, using river catchments as strategic planning units. This process provided for the assessment, incorporation and monitoring of environmental, social and economic sustainability in strategic planning (ibid). Only a generic process could be developed within the ambit of this project due to the complexity and uncertainty surrounding institutional structures and planning processes

(Respondent 15, consultant, 2003). As discussed in section 3.3, planning processes varied from one Local Council area to another. This lack of clarity meant that there was no 'institutional home' for this process, meaning that it could not be practically implemented as part of the project.

The second part of the project involved the strategic environmental assessment of each of the 18 catchments in the eThekwini municipal area, using a range of environmental status quo indicators to 'grade' the environmental health of each catchment. Using this information, the report outlines the implications and appropriate responses required by municipal departments to improve environmental quality and mitigate future development impacts on a catchment-by-catchment basis through appropriate management interventions. Key extracts from the report are attached as Appendix 1, including the detailed environmental status quo assessment of two catchments at different ends of the sustainability spectrum (Mgeni and Umgababa).

3.6.3 Conceptual basis of the project

The project is based essentially on two of the key concepts that underpin the Environmental Services Management Plan (2001), namely 'catchment management and planning' and 'environmental services' (refer to section 3.5.7 above). The use of catchments in planning is explicitly explained at the beginning of the report, while the environmental services concept is implicit in the methodology and content of the report. The project's approach is based on "the concept of river catchments forming strategic planning units" (Diederichs et al., 2002: 1). The impacts of development, such as flood damage and water quantity and quality issues, are most often experienced within a river catchment. Consequently, by planning development in a strategic way within the environmental carrying capacity constraints of each catchment, many environmental, social and economic impacts can be minimised (ibid).

The report argues that in the current planning context of the eThekwini municipality, catchments provide a number of benefits (Diederichs et al., 2002: 2). At a strategic level, catchments provide for the assessment of "the overall differences in environmental quality across the eThekwini area" (ibid). Planners are then able to distinguish between catchments on the basis of their environmental health and ability to provide environmental services, enabling improved decision-making about development and resource conservation. A catchments approach is useful for integrated development planning, providing a means of integrating different development sectors within a defined geographic area. This will enhance resource allocation and cost-effectiveness in planning. Area-Based Management can benefit from a

catchments approach by translating the environmental status quo into appropriate settlement densities, land uses and infrastructure in each catchment or area. Catchments also provide a basis for the development of LUMS, by encouraging the review of zones, clauses, regulations and procedures relating to urban sustainability. Lastly, catchments provide a mechanism for sectoral planning and investment to be integrated within a geographically defined area, related to environmental quality of specific catchments.

3.6.4 Strategic Catchment Assessment Process

The generic Strategic Catchment Assessment (SCA) Process developed by the consultants is based on a constantly updated database that feeds into environmental indicators to determine the environmental sustainability of each catchment. Using this information, the environmental condition of catchments and the responses to poor environmental quality should be evaluated for acceptability, and standards should be reviewed where necessary. The pressures on the environment should be evaluated in terms of environmental services supply and demand. The outcomes of this evaluation stage should direct action in area-based and sectoral planning in the city, by providing information on the opportunities, constraints and responses required. Figure 3.6 illustrates the SCA process.

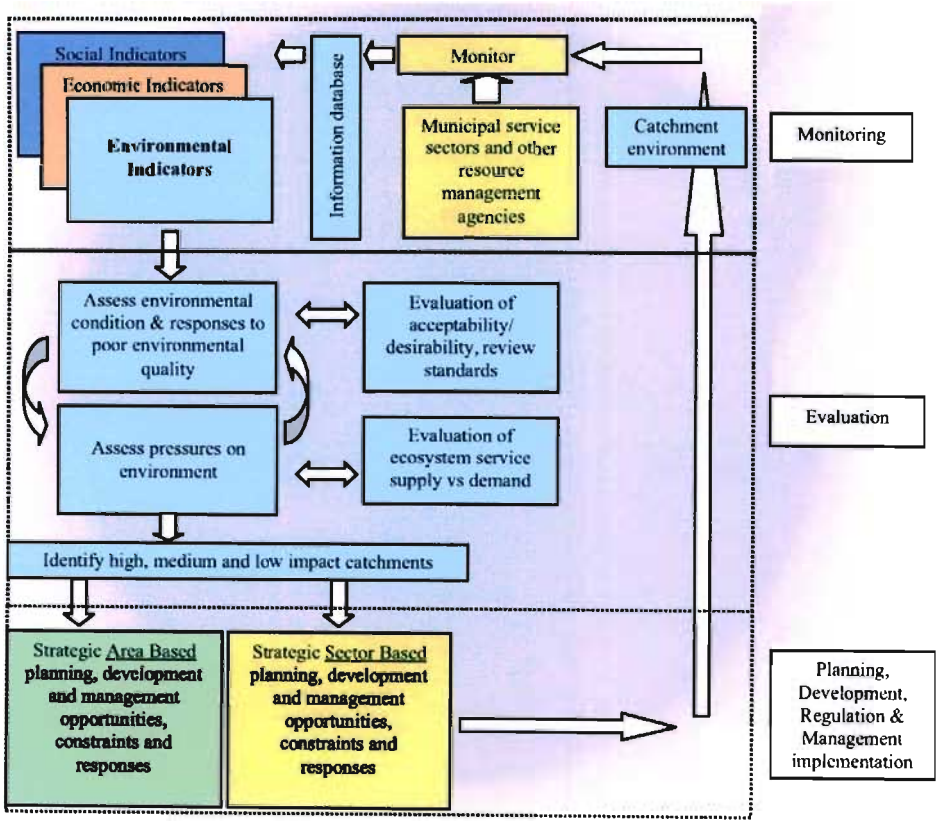

Figure 3.6 Strategic Catchment Assessment process (Diederichs et al., 2002: 3)

3.6.5 Environmental Status Quo Indicators

Indicators were the key tool used in the SCA process to determine the environmental status quo of each catchment. Only environmental (biophysical) indicators were developed in the project. The environmental indicators helped to identify: (1) the pressures that are placed on the catchment environment by existing development; (2) the condition of the catchment as a result of these pressures; and (3) the social and economic responses to catchment condition (Diederichs et al., 2002). Indicators were divided into eight themes – air quality, water quality, water quantity, flooding, sedimentation/erosion, loss of biodiversity, agricultural production, and recreational/cultural/educational uses. For each indicator theme, the environmental condition of each catchment was graded as either poor, moderate or good.

Based on the environmental indicator results, an overall status quo assessment of each catchment was then made, coded as green, orange or red. Green catchments are in good condition and currently developed within sustainability limits. Orange catchments are in moderate condition and nearing unsustainability. Red Catchments are in poor condition and already unsustainable. In the eThekwini municipal area, this status quo assessment indicated that four catchments have a green status, six catchments have a red status and the remaining eight catchments have an orange status. The red catchments coincide with the highly developed core of the municipal area, while the green catchments are located in the southern extent of the municipal area which has low levels of development.

3.6.6 Strategic Planning Implications

Using the environmental indicator information, the report outlines the implications for planning and management of each catchment, taking into account the Spatial Development Framework and urban growth scenarios for the area. The report first describes the anticipated impacts of development on environmental services. It then goes on to recommend specific responses to manage development pressures and protect the environmental assets of the catchment. Four types of responses are identified - strategic, land use, environmental services asset and infrastructural responses. These are linked to the sectoral municipal departments with the mandate to respond to these issues.

According to the Catchments Report, the SCA shows that the majority of the municipal area is in a condition where development demands exceed, or are approaching levels that exceed, the ability of the natural environment to sustain the type of environmental quality outlined in the vision of the municipality (Diederichs et al., 2002). Interventions are therefore required to

ensure the future quality of the municipal environment. The report briefly provides general guidelines for:

- managing urban and rural development, and agriculture;
- managing major external influences outside of the municipal area through cooperation with neighbouring municipalities;
- managing individual catchments with their unique characteristics and issues; and
- monitoring environmental quality.

The report concludes by listing the key actions required in response to the SCA (Diederichs et al., 2002), as follows:

- increased political awareness and commitment;
- the creation of public awareness relating to how individuals and organisations can improve environmental quality;
- incorporation of the findings of the SCA into the LTDF, ABM initiatives, and sectoral planning and programming processes;
- appropriate development principles, guidelines and procedures; and
- establishment of integrated, inter-sectoral monitoring systems to regularly generate and assess environmental indicators.

3.7 Conclusion

The Catchments Project and its associated report, "eThekwini Catchments 2002: A Strategic Tool for Planning", emerged out of the specific circumstances of the eThekwini Municipality and its national and local context. National legislation and local municipal policy and practice all combined to influence the project process and outcomes. It is the task of this study to interpret these contextual circumstances in terms of the role that discourse plays in environmental policy making. By uncovering the discursive basis of the Catchments Project, it will be possible to show how the relative power of different perspectives on the relationship between society and the environment (such as EM and strong sustainability) results in specific environmental policy outcomes. Prior to exploring these issues, however, it is first necessary to discuss the methodological approach taken in this research.

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1 Introduction

Environmental research tends to focus predominantly on solving practical environmental problems, using a scientific or technical approach. Reflecting a realist perspective towards the environment, environmental problems and issues are perceived as existing independently of social actors. Language is considered as a neutral, value-free means of describing these problems or issues. This research, however, draws from a different ontological perspective – it contends that reality is socially constructed, and that language plays a key role in that construction (Hajer, 1995; Terre Blanche and Durrheim, 1999). From this perspective, environmental issues are socially constructed through the medium of language. Social constructionism is concerned with uncovering and understanding discursive effects in society, through the analysis of the spoken and written word, or 'discourse analysis'.

Consequently, discourse analysis was the methodology used in this research to explore environmental decision-making in the eThekwini Municipality. Semi-structured interviews with key municipal officials and the project consultants were used as the principal means of gathering 'discursive material' for analysis. Relevant municipal reports were also analysed. The analysis phase used a framework developed by Hajer (2003) incorporating his core concepts of the story-line, discourse coalition, and discourse structuration and institutionalisation. The chosen framework aimed at not only defining discourses and their associated story-lines, but also attempted to understand the discursive processes and dynamics which lead to discourse institutionalisation in the municipal context (Hajer, 1995, 2003). The nuances of individual discourses were therefore deemed as significant as their social and institutional dimensions and effects.

The practical, systematic side of qualitative data analysis was guided by an approach developed by Dey (1993, cited in Kitchin and Tate, 2000). Dey's approach is applicable to the study of all types of qualitative data. Discourse analysis is but one of a range of qualitative research methods, all sharing a number of common factors. These include: an emphasis on the subject's perspective and interpretations of reality; understanding actions and meanings in their social context; the use of open and relatively unstructured research designs; and a preference for inductive research, which requires strong theory if generalizations are to be made (Robinson,1998). Unlike quantitative research, the use of qualitative research methods such as

discourse analysis is not intended to be representative but illustrative. Qualitative approaches "can never be replicated, only corroborated by similar studies or complementary techniques" (Valentine, 1997: 111). The value of qualitative approaches is their ability to generate rich multi-layered material which can reveal the complexities of the social world.

This chapter provides an overview of the primary and secondary data sources that formed the basis of the research, the interview process and the role of the researcher in the interviews, the discourse analysis framework and methodology used, and concludes with a brief discussion of the limitations of the research.

4.2 Data Sources

4.2.1 Primary data

The primary data was sourced through fifteen interviews held with municipal officials and the project consultants over a period of three months, from April to June 2003, as well as from the proceedings of the final catchment project meeting held in November 2002. The interview candidates were chosen in consultation with staff from the Urban Strategy Department, and focused on gaining access to as broad a spectrum of municipal departments and their related functions as possible. The majority of the municipal officials interviewed had attended the Spatial Theme Group meetings, at least sporadically, and therefore were involved in the project as it progressed. One official from the Wastewater Department, who had been involved to some extent in the project process, refused an interview, due to his lack of interest in and support for the project.

Although not involved in the project process, the Municipal Manager, the IDP co-ordinator, the Manager of the Environmental Management Branch, and a manager of one of the five Area-Based Management pilot areas were also interviewed. Their input gave more of an outsider's viewpoint to the project, but was useful to situate the Catchments Project within the broader municipal planning and development context. Attempts to set up interviews with officials from other relevant municipal departments that had had none or limited involvement in the project, such as Health, Water and Economic Development, were unsuccessful. This was partly because the officials did not see any value in speaking about a project which they knew nothing about. Since the interview process was not intended to be a process of educating municipal staff on the project, this line of interview questioning was not pursued. All three of the key project consultants were interviewed due to the different skills and contributions that they brought to the project. Table 4.1 lists the officials and consultants interviewed. The table indicates either

the municipal department or area of responsibility of each municipal official, depending on which more accurately described their role in the municipality. The training backgrounds of the respondents are also shown. Names have been withheld to ensure anonymity.

Table 4.1 eThekwini Catchments 2002 interviews: respondents' details

ETHEKWINI CATCHMENTS 2002 INTERVIEWS: RESPONDENTS' DETAILS			
	Municipal Department/ Responsibility	**Profession/educational background**	**Interview Date**
01	Urban Strategy Department	Town and Regional Planner	10 April 2003
02	Urban Strategy Department	Town and Regional Planner	29 May 2003
03	Environmental Management	Environmental management, urban ecology	18 May 2003
04	Environmental Management	Environmental science	10 April 2003
05	Integrated Development Plan[5]	Town and Regional Planner	06 May 2003
06	Development Planning[6]	Town and Regional Planner	14 May 2003
07	Land Use Management System[7]	Town and Regional Planner	13 June 2003
08	Area-Based Management	Town and Regional Planner	18 June 2003
09	Transport	Transport engineer	29 April 2003
10	Drainage and Coastal Engineering	Water engineer	06 May 2003
11	Housing	Town and Regional Planner	08 May 2003
12	Municipal Manager	Town and Regional Planner, geographer	24 June 2003
13	Consultant	Urban planning, urban design, environmental planning	29 April 2003
14	Consultant	Environmental science	07 May 2003
15	Consultant	Environmental economics, urban planning	20 May 2003

4.2.2 Secondary data

In addition to the transcribed interview material, secondary data, in the form of several key municipal reports, was also used as a source of text for discourse analysis. The most important source was the project report, "eThekwini Catchments 2002: A Strategic Tool for Planning" (Diederichs et al., 2002), as well as the project terms of reference and an interim progress report prepared by the consultants. Other texts included the city's Environmental Services Management Plan, the Integrated Development Plan, a Drainage and Coastal Engineering

[5] Respondent 5 works in the Urban Strategy Department, and is responsible for the IDP.
[6] Respondent 6 works in the Development Planning and Management Department and is responsible for planning and development control at a local implementation level.
[7] Respondent 7 works in the Development Planning and Management Department and is responsible for implementing the city's new Land Use Management System.

Department report related to the new institutional structure based on catchment management, as well as the draft proposal to establish the Mvoti to Mzimkulu Catchment Management Agency. The theoretical framework of this research was developed by drawing from an extensive review of literature relating to discourse theory, environmental politics and policy making, environmental discourse, ecological modernisation, environmental justice and sustainable development. As there is limited literature originating in South Africa (or in the developing world context) which focuses on environmental politics and discourse, the consequent theoretical framework is dominated by European discourse theory. The applicability of such literature in the South African context could therefore be questioned. This issue is discussed further in the concluding chapter, when the use of the chosen discourse theory for this case study is reviewed.

Substantial work was done in developing the theoretical framework prior to initiating interviews, to ensure that the interviews were held in such a way that the interview questions and discussions resulted in appropriate text for discourse analysis. A clear theoretical understanding meant that during the interviews and the transcribing process that followed, dominant story-lines, policy vocabularies and discourses could already be identified. This aided the analysis phase of the research process, and ensured that a strong link between the theory and data was established.

4.3 Interviews

4.3.1 The interview process

Once the initial list of interview candidates had been generated, candidates were contacted telephonically or by email to request an interview. An overview of the research rationale, reasons for the interview, and interview details was used to guide this initial conversation (see Appendix 2). Interviews were arranged at the respondent's place of work, during office hours. Most interviews were 45 minutes to one hour long. With the agreement of the interview respondents, all interviews were taped, and then fully transcribed later. Apart from needing a detailed transcript of the interview conversations for discourse analysis purposes, taping of the interviews enabled full attention to be given to the respondent. Taping aids the progress and flow of the conversation by allowing the researcher to concentrate on how to conduct the interview as well as the subtleties of what is being discussed (Valentine, 1997; Robinson, 1998).

Semi-structured interviews were chosen as the means of providing sufficiently detailed and rich textual material for discourse analysis. Also referred to as 'semi-standardised', 'in-depth',

'informal' and 'focused' interviews, semi-structured interviews are commonly defined by their conversational nature (Ballard, 2002). Such a conversational approach means that each interview varies "according to the interests, experiences and views of the interviewees" (Valentine, 1997). Respondents are able to discuss issues from their perspective in their own words, and are able to explain and elaborate further where necessary. This allows for issues to be explored fully with the researcher, providing deeper, multi-layered material than that achieved through more structured interview methods or questionnaires (ibid). Through this approach, interesting perspectives and themes may emerge that were not anticipated by the researcher. From a social constructionist perspective, therefore, semi-structured interviews "are particularly suited for studying people's understanding of the meanings in their lived world, describing their experiences and self-understanding, and clarifying and elaborating their own perspective" (Kvale, 1996, cited in Ballard, 2002: 58). However, it should be clarified that, unlike interpretive research, a social constructionist approach does not use the interview to interpret and understand people's experiences. Instead the purpose of the interview is to uncover those linguistic patterns which illustrate how language is used to create particular social realities (Terre Blanche and Durrheim, 1999).

In order to provide some structure and direction to the interviews and to ensure that the main areas of discussion were covered, guideline interview themes and questions were developed. These were adapted for the different respondents, depending on their specific role in the project process (see Appendix 3). As opposed to a more formal style of questioning the use of an interview guide approach allows for flexibility in the interview sequence and wording of questions (Kitchin and Tate, 2000). Frequently the interviews did not follow the sequence of the guideline, in order to encourage the flow of conversation, and to follow the respondent's train of thought. As the interviewer, it was important therefore to keep track of which issues had been discussed, and to steer or re-orientate the conversation where necessary. Often respondents would take the line of discussion away from the research questions, raising other interesting perspectives or issues. However, once these issues had been adequately discussed, it was important to bring the discussion back to the core research questions or issues. The challenge was maintaining a balance between "keeping the interview focused and letting it flow and take its own course" (Valentine, 1997: 120). Conducting the interviews certainly was a learning process, and particularly in the earlier interviews, certain issues or questions may not have been as adequately explored as one would have liked. However, the chosen approach resulted in a wealth of interesting and often unexpected discourse and associated contextual information, which a more formal structured approach would likely have missed.

4.3.2 Role of the researcher in the interview

An important element of any research is to reflect on the researcher's role in the generation and interpretation of data (Robinson, 1998). This 'reflexivity' is defined by England (1994, in Valentine, 1997: 113) as "self-critical sympathetic introspection and the self conscious analytical scrutiny of the self as researcher". In-depth interviews are often criticized from the positivist camp for interviewer's bias. However, it is generally recognized in the social sciences that no research can be completely objective (Valentine, 1997). All research is implicitly or explicitly informed by the particular understanding, experiences and context of the researcher. Not even a skilled and experienced researcher "can play a purely facilitative role in allowing the interviewee to give expression to her or his feelings and experiences" (Terre Blanche and Durrheim, 1999: 153). The researcher plays a key role by deciding on which questions to ask and issues to introduce, and by guiding the conversation in certain directions. Consequently, the material generated in an interview is not a reflection of the respondent's perspectives or discourse alone, but is produced by the interaction between the researcher and the respondent (Ballard, 2002; Terre Blanche and Durrheim, 1999). Furthermore, the discursive material produced in an interview situation is also a product of the broader social system and its discourses (Terre Blanche and Durrheim, 1999).

It is also essential to be aware of the power relationships that exist between researcher and respondents during interview encounters (Valentine, 1997). Sharing a similar professional background with respondents can facilitate the interview conversation, producing rich, detailed text based on mutual understanding and respect (ibid). This was certainly the case with the interviews conducted with the municipal officials, many of whom were town and regional planners or environmental scientists. As a researcher with an educational background in urban and regional planning and environmental management, as well as over eight years work experience in the town planning field, the area of discussion was familiar territory. A good understanding of planning and environmental concepts and familiarity with the policy vocabularies of these fields meant that most conversations were comfortable and non-threatening, facilitating in-depth discussions of the project and its context. A good understanding of the institutional context and development and planning process issues also aided discussion. This meant that unnecessary time was not spent on understanding this context, but the discussion could focus specifically on the project and more complex related issues.

It is not only the researcher who exerts power in the interview relationship. Respondents are also able to exert power through controlling access to knowledge, choosing which information

or perspectives to share and which to exclude (Valentine, 1997). Respondents can channel the conversation to the discussion of issues which may not be central to the research questions, or may attempt to steer the conversation away from issues which they do not wish to discuss. This was more evident in some interviews than others. One interview in particular was especially difficult to conduct as the respondent was more interested in asking questions about the project in solving certain problems, rather than answering the interview questions.

4.4 Discourse Analysis

4.4.1 Hajer's discourse analysis framework

There are a variety of ways to approach the analysis of discourse, dependent on the particular research focus or orientation. This research uses Hajer's (2003) framework for discourse analysis which is organised around his core concepts - the story-line, discourse coalitions, epistemic notions and policy vocabularies. It is also structured to explore the processes of discourse structuration and institutionalisation. Hajer's framework provides a well-structured guide for environmental policy discourse analysis, and maintains strong links between the data and key theoretical concepts. The framework is divided into three components: (1) study of the terms of policy discourse, (2) analysis of the formation of discourse coalitions, and (3) analysis of particular institutional practices.

As discussed in Chapter 2, the first component of the framework, the study of the terms of policy discourse, is defined by Hajer, drawing from Connolly (1983, in Hajer, 2003:104), as "institutionalised structures of meaning that channel political thought and action in certain directions". Hajer divides these terms of policy discourse into three layers – story-lines, policy vocabularies and epistemic notions. These are discussed in detail in Chapter 2. The second component involves the analysis of the formation of discourse coalitions. This requires the identification of those actors that coalesce around specific story-lines, even though they may come from different policy domains. The third component is focused on the particular institutional practices in which discourses are produced and reproduced. It explores the dynamics involved in the entrenchment of specific discourses in the institutional context through the processes of discourse structuration and institutionalisation.

For the purpose of this research, Hajer's framework has been adapted slightly, as shown in Table 4.2 below. For example, the terms of policy discourse have been re-ordered so that epistemic notions and then policy vocabularies are considered before story-lines. Since epistemic notions are the broader framing devices structuring policy discourse, it is more useful

to study them first before focusing on the policy vocabularies and story-lines more specific to the policy discourse being studied. It is also helpful to identify the policy vocabularies prior to the story-lines. Policy vocabularies act as signposts for different policy fields, for example the concept of 'densification' (a policy vocabulary) is associated with the spatial planning policy field. When such policy vocabularies are evident in an extract of discourse that reflects a particular story-line, they can indicate the policy field from which that story-line emerged.

Table 4.2 Discourse analysis framework (adapted from Hajer, 2003)

DISCOURSE ANALYSIS FRAMEWORK	
1	**Study of the terms of policy discourse**
1.1	*Epistemic Notions* Regularity in thinking of a particular period, which has formative power, i.e. structures the understanding of reality without actors necessarily being aware of it. Epistemic notions are not formulated in their own right for particular policy purposes.
1.2	*Policy Vocabularies* Set of concepts structuring a policy, that are consciously developed by the policy makers, and supported by a particular scientific theory.
1.3	*Story-lines* Short narratives that "help people to fit their bit of knowledge, experience or expertise into the larger jigsaw of a policy debate" (Hajer, 2003: 104).
2	**Analysis of the formation of discourse coalitions around story-lines** Coalition of actors from different policy domains that refer to shared story-lines.
3	**Analysis of particular institutional practices** Institutional practices are the context and outcome of discourse production and reproduction. Has discourse structuration and/or institutionalisation occurred? How does this occur?

This is illustrated in the following extract of a municipal official's discourse: "The Spatial Framework of the IDP document is starting to make some of the difficult choices about rehabilitating the CBD and the Southern Basin, and that immediately forces the issue of starting to limit growth in the north, starting to densify ... instead of the leapfrog development that is happening" (Respondent 2, Urban Strategy, 2003). This extract reflects a story-line which argues that 'city development must concentrate on densification of the core areas to promote integration and the efficient use of resources'. The word 'densify' in the above extract indicates that this story-line originates in the spatial planning policy field. The relationship between

epistemic notions, policy vocabularies and story-lines will become clearer when demonstrated in the analysis of the eThekwini Municipality's environmental discourse in Chapters 5 and 6.

4.4.2 The analysis process

While Hajer's framework provided the key elements of focus for the discourse analysis, practical guidance on qualitative data analysis was drawn from an approach developed by Dey (1993, cited in Kitchin and Tate, 2000). As argued by Kitchin and Tate (2000: 230), qualitative data analysis "is largely an inductive, open-ended process that is not easily captured by a mechanical process of assembly-line steps". However, Dey's approach was useful to structure the analysis process so that the volume of discursive material could be practically and thoroughly managed. Dey's approach consists of three main phases: description, classification and connection (Kitchin and Tate, 2000).

The description phase entailed undertaking the full transcription of all of the interviews. Transcribing took place as soon as possible after each interview had been conducted, to ensure that the completed transcripts were as accurate as possible. Since the discourse analysis was not focused on linguistic nuances and speech patterns, the transcripts were straightforward records of what was discussed. At this stage, it was already possible to start identifying certain policy vocabularies and story-lines as they appeared in the transcribed text.

The classification phase involved breaking up the data into constituent parts and then placing them in relevant categories (Kitchin and Tate, 2000). This process helped to identify similarities and differences in the data. Using Hajer's framework, each interview transcript was first reviewed to identify the terms of policy discourse, i.e. the epistemic notions, policy vocabularies and story-lines evident in the text. Coloured pens were used to identify these different elements. Secondly, the transcripts were reviewed for any evidence of a discourse coalition related to the catchment discourse and its story-lines. Lastly, data related to the institutional context, including evidence of discourse structuration and institutionalisation was flagged.

Once the initial review of each transcript was completed, extracts from each interview were then 'cut and pasted' into a new Word file, to reflect each element of the analysis in the order shown in Table 4.2. Through this classification process it became evident that many of the story-lines identified were reflective of a broader discourse context than the catchment discourse. While the focus of the research was on the Catchments Project and its associated catchment discourse and story-lines, it was important to reflect on the other story-lines influencing environmental

policy making. Consequently the story-line element was divided further into different types of story-lines – planning, environment-development (including sustainability) or catchment story-lines. It was then possible to group together those extracts reflecting these different aspects. As this was done, the specific arguments of different story-lines began to emerge. Similarly, the institutional context element was broken into more general municipality-wide information and that which applied directly to the catchment project.

At the end of this step each interview had been reworked in a new Word file to reflect each of Hajer's key elements. The next step in the classification phase involved a further refinement and ordering of the data, in order to bring the different elements identified in each individual transcript together. Extracts from each interview transcript were grouped together in new Word files, with each file dealing with one of Hajer's elements. Each piece of text was coded with the number of the respective respondent, in order not to lose the source of these extracts. The municipal staff transcripts were grouped together separately from the consultants' transcripts, to ensure that the results of the research gave a reflection of discourse within the municipality. The material generated from the consultants' interviews was useful for illustrating the key discursive influences on their work, as well as linkages between their work and the discourse dynamics in the city.

Firstly, extracts reflecting the epistemic notions identified in the individual transcripts were grouped together in a new Word file, referenced with the respective numbers of the individual respondents. Secondly, the policy vocabularies from all the interviews were grouped together and then divided into different policy fields. In general, these policy fields aligned with the different types of story-lines identified earlier, i.e. catchment, planning and environment-development. The environment-development policy field was separated further into a sustainability and environmental policy field, since this more accurately described the nature of these policy vocabularies. For improved understanding, the policy vocabularies were also separated into the concepts, principles and policy tools which reflected that policy field. The third step involved setting up Word files for each identified story-line. As with the policy vocabularies, the environment-development story-lines were further broken down into sustainability and environmental management story-lines.

While this part of the analysis identified general municipal epistemic notions, policy vocabularies and story-lines, as well as those specific to the catchment project and approach, the remainder of this 'refinement' phase focused strongly on the catchment project. The next step

concentrated on the analysis of the catchment discourse coalition. This involved pulling together the relevant extracts from the interview transcripts which illustrated how a discourse coalition had formed around the catchment story-line, who the key role-players in the project were, and the influence of the consultants during the project process. The last step in this phase drew together interview extracts relating to the institutional issues surrounding the catchment project, particularly focussed on discourse institutionalisation. To aid the analysis process, these extracts were grouped into a range of institutional aspects and issues.

Once the full classification of the interviews had been completed in this manner, the final important step in this phase involved reviewing other relevant texts. These included the Catchments Report, the IDP and SDF documentation, as well as the full transcript of the Catchments Report presentation to municipal staff held in December 2002. This analysis also used the framework outlined in Table 4.2, but concentrated on the terms of policy discourse.

The third stage of the analysis process, the connection phase, focused on identifying and understanding the relationships and associations between the various elements of the analysis (Kitchin and Tate, 2000). It was thus possible to identify the influence of the epistemic notions on the policy vocabularies and story-lines. It also became evident that policy vocabularies and story-lines were often connected due to their origins in a particular policy field. As argued earlier, policy vocabularies 'flagged' the policy field from which a specific story-line may have originated. The use of the same or similar policy vocabularies in different story-lines reflecting different policy fields indicated the relationships between story-lines and their respective discourses. In particular, it was possible to explore the influence of the broader municipal terms of policy discourse on the catchment discourse. Thus this connection phase of the analysis enabled the exploration of the complex overlapping nature of discourse interaction in the municipality.

In addition to exploring the associations between these different elements, the connection phase also involved reflecting on how the terms of policy discourse aligned with the EM and strong sustainability discourses. Elements of EM and strong sustainability were identified in the municipal epistemic notions, policy vocabularies and story-lines. Due to the overlap between municipal discourses and the catchment discourse, the EM and strong sustainability aspects in the municipal discourses had certain effects on the catchment discourse, and also influenced the way in which the Catchments Project was developed. These issues will be explored in detail in the following two chapters.

4.5 Limitations

All research is subject to certain limitations. The use of semi-structured interviews to generate qualitative data, and the consequent use of a discourse analysis approach means that a degree of subjectivity was an integral part of this research. As discussed in section 4.3.2 the particular biases and perspectives of the interviewer affect the interview process, including the questions and issues that are raised. It is quite possible that if another researcher had interviewed the respondents, different insights into discourse dynamics in the municipality would have emerged. This implies that generalisations, for example, about municipal environmental discourse in municipalities in the rest of South Africa, cannot be made. The development of the Catchments Project in the eThekwini Municipality is a unique situation, which has been used to illustrate how environmental discourse dynamics operate in the institutional context.

A further limitation of the research is that its scope was limited to those involved in the Catchments Project. Only a small group of municipal officials were interviewed. A wider representation of municipal departments, for example Economic Development and Health, would probably have resulted in more variation in the data. Additional terms of municipal policy discourse and different effects of the EM and strong sustainability discourses may have emerged. However, their lack of involvement and interest in the Catchments Project would have made questioning difficult. It was not the intention of this research to 'educate' municipal officials about the project, as this would have led to further bias in the responses of the respondents. It was therefore best to limit the interviews to those involved in, or sufficiently aware of the project.

The short period of time spent with each respondent also limited the research. The research findings are based on these 'slice in time' interviews. Longer interviews, or several interviews would have revealed more and/or reinforced what was already said. Being involved in the Catchments Project process, from project initiation to completion, would also have been useful. Such close involvement in the project may have generated some useful data indicating the changing nature of discourse over time. It is likely that project meetings and discussions would have more clearly illustrated the argumentative side of Hajer's theory, by recording the argumentative positioning of municipal actors against one another.

4.6 Conclusion

Despite these limitations, however, the use of Hajer's discourse approach to explore municipal environmental policy making has proved invaluable. This chapter has attempted to provide a concise overview of how this research was conducted. Discourse analysis is a complex and evolving process, which requires constant review and reflection to allow the different elements (and relationships between elements) to emerge. Much of this reflection continued while the analysis chapters of this thesis were being written, resulting in new insights being added. The following two chapters present the results of the discourse analysis process. The first chapter explores the broad environmental discourse dynamics in the eThekwini Municipality. This provides the discursive context for understanding the catchment discourse, discussed in the next chapter. An important component of this analysis involves an examination of how municipal environmental discourse reflects EM and strong sustainability.

CHAPTER FIVE: ENVIRONMENTAL DISCOURSE DYNAMICS IN THE ETHEKWINI MUNICIPALITY

5.1 Introduction

Environmental discourse in the eThekwini Municipality is the outcome of a mix of external, internal and local influences that are appropriated or responded to by municipal officials and councillors in a certain way, and which are adapted to suit the particularities of the local context. Some of these influences were examined in Chapter 3 – the city's social and economic situation, national legislation, and key internal planning, development and environmental initiatives. Of interest is the way in which the consequent municipal environmental discourse reflects these influences (or does not), interpreted through the lens of 'the sustainability continuum' – the pathway from EM to strong sustainability. It is therefore helpful to begin this exploration of environmental discourse dynamics in the municipality with a review of national legislation, to illustrate how this external influence reflects EM and strong sustainability. The detailed analysis of the discourse of municipal officials interviewed, as well as municipal documents and practices, which forms the main part of this chapter, will provide more evidence of these external influences.

Firstly, however, it would be beneficial to consider the relevance of EM to South Africa, a developing country with associated social and economic development challenges. As argued in Chapter 2, EM is essentially a northern or Eurocentric discourse that is best suited to industrialised nations. It focuses on technological innovation to reduce environmental impacts, mainly directed at business and industry. EM tends to neglect or minimise the social dimension of environmental problems, giving precedence to management and scientific approaches and solutions. It assumes that the western approach to development can be applied to all countries in a sustainable manner. However, as Blowers and Pain (1999) argue, the assumed conditions for EM are not fully present in a developing context such as South Africa's. While some of the technological and management aspects can be (and are being) applied to industry and business in South Africa, the country has far more pressing concerns relating to the environment. These relate to issues of poverty, poor living conditions, environmental health and overuse of natural resources, which result in negative impacts on the environment. An EM approach is not able to adequately respond to these problems.

A more appropriate approach to the 'environmental problem' in South Africa is provided by the strong sustainability discourse. Strong sustainability recognises that environmental degradation is largely related to issues of inequality, unequal power relations and access to resources. As such national and local government needs to promote social and environmental justice. Government interventions include playing an increased role in providing assistance to the poor, to ensure that environmental conditions do not worsen. Local efforts are required to facilitate self-sufficiency, as well as to involve local communities in environmental management and decision-making. This requires a form of participative democracy that allows local arguments and traditional knowledge to be taken as seriously as scientific and technical information.

With these issues in mind, the next section explores how the EM and strong sustainability discourses have been appropriated in South Africa's legislation. This provides a background for the remainder of the chapter, which uses Hajer's discourse analysis framework as a guide to discuss the key terms of policy discourse influencing environmental decision-making in the city. The chapter concludes with a review of where municipal environmental discourse is placed on the continuum between EM and strong sustainability.

5.2 EM and strong sustainability reflected in national legislation

The wide-ranging changes in legislation in South Africa, brought about since the establishment of the new democratic government in 1994, reflect elements of both the ecological modernisation (EM) and strong sustainability discourses. In response to the past policies and actions of the apartheid government, civil rights, equity and empowerment issues were a key focus of the new ANC government (Hamann et al., 2000). Consequently, the Constitution's Bill of Rights promotes environmental and social justice, participation of the public in government decision-making, and social and economic development of the poor and disadvantaged (RSA, 1996). Environmental justice is affirmed in the 'environmental right' which states that everyone has the right to "an environment that is not harmful to their health or well-being" (ibid: 26). Drawing on these constitutional principles, the National Environmental Management Act is a landmark piece of legislation which draws attention to strong sustainability concerns in environmental management, such as environmental justice, adequate public participation and the importance of recognising all forms of knowledge, including traditional knowledge.

In the same vein, the Municipal Systems Act promotes the inclusion of the local community in municipal decision-making through a system of participatory governance, as well as

environmental justice and community-focused development. In particular, the Municipal Systems Act requires that the IDPs prepared by municipalities should represent the needs and aspirations of the local community (RSA, 2000: 29). The National Water Act also has a strong social focus, aimed at ensuring equitable access to water and participation in water resource management. The Act's provision for the establishment of catchment management agencies promotes community participation, to be enhanced through the involvement of local water user associations. These pieces of legislation therefore provide a strong basis for "deliberative and inclusive participation" (Hamann and O'Riordan, 2000: 28).

The story-line of sustainable development is a common thread running through South African legislation, including the Constitution and NEMA. Municipal governments are obliged to carry out their mandate of developmental government in a sustainable manner as outlined in the Municipal Systems Act (RSA, 2000). Depending on how sustainable development is interpreted, this story-line can represent both strong sustainability and the EM discourse. Other EM concepts and principles are also reflected in legislation. The EM concept of integration is a key focus of NEMA, which promotes the integration of government's responsibilities and roles in relation to environmental management through co-operative governance. Integration is also evident in the National Water Act's catchment management approach and the requirement that municipalities prepare Integrated Development Plans. Certain aspects of western EM, such as technological innovation and improvements in how business is run along ecological lines, are not dominant in the legislation. NEMA does, however, promote EM policy principles relating to internalisation of costs, such as 'the polluter pays' and 'precautionary' principles.

A key trademark of the EM discourse is its focus on technical and managerial approaches to the environment. The institutionalisation of international environmental management approaches in South Africa has mainly been achieved through the 1997 EIA regulations. The use of environmental management tools to comply with the regulations, such as EIAs and EMPs, tend to be reactive and technical, relying on scientific data and the contributions of scientific experts (Oelofse et al., 2002). The biophysical environment is emphasised while associated social issues are sidelined. According to Sowman (2002) the way that EIAs are currently conceptualised means that they have limited usefulness in contributing to sustainability. While the principles of integration are promoted by legislation, in practice there is very limited integration between the environmental assessment process and municipal planning and development activities (ibid). Apart from legislated environmental management tools, the Department of Environment Affairs and Tourism also promotes other tools such as Strategic

Environmental Assessment, the development of ISO 14000 sustainability management systems and other managerial approaches to the environment reflecting the EM discourse.

The EM and strong sustainability discourses are therefore both reflected in national legislation. The key question in aiming for sustainability in South Africa is whether the legal representation of the strong sustainability discourse is being carried out in practice. Both Peet (2002a and 2002b) and Bond (1999, 2002) draw attention to how the original social democracy policy discourse of the ANC government has been overtaken by a neoliberal discourse which emphasises privatisation, deregulation and trade liberalisation, in direct response to the globalisation agenda. The original strong sustainability intentions of government therefore contrast sharply with its current economic agenda. In practice therefore, the EM discourse, with its focus on economic development imperatives, still tends to dominate development decision-making. As argued by Hamann and O'Riordan (2000: 33), "(p)oliticians are adept at providing the right political rhetoric at the right times, without the concomitant action". It would appear that the strong sustainability discourse remains predominantly at the level of discourse and rhetoric, not moving down to being institutionalised through practice.

With this legislative context in mind, how then has environmental discourse in the eThekwini Municipality been influenced? The remaining sections of the chapter discuss the key epistemic notions, policy vocabularies and story-lines relating to the environment and development in the city, and how they reflect EM and strong sustainability. These terms of policy discourse played a key role in how the eThekwini Catchments project was framed and developed, and continue to influence the institutionalisation of the catchment discourse. Figure 5.1 below illustrates this environmental discourse context of the Catchments Project, and provides a guide for the discussion to follow.

5.3 Municipal Epistemic Notions

Discourse analysis has identified four key epistemic notions that influence environmental policy-making in the eThekwini municipality. These concepts or ideas unconsciously structure the thinking of the municipality at a general level. In other words, they are not exclusive to any one policy field, municipal function or profession, nor have they been consciously developed to direct municipal policy and action. In fact, they "structure the understanding of reality without (municipal) actors necessarily being aware of it" (Hajer, 2003: 106). However, they play an important role in the way that policy is developed both conceptually and at a practical level. These epistemic notions encourage an approach to policy-making that is strategic, integrated,

systems-based, and which accords a central role to data or information. While there are clear linkages between these structuring ideas, they are most usefully discussed individually.

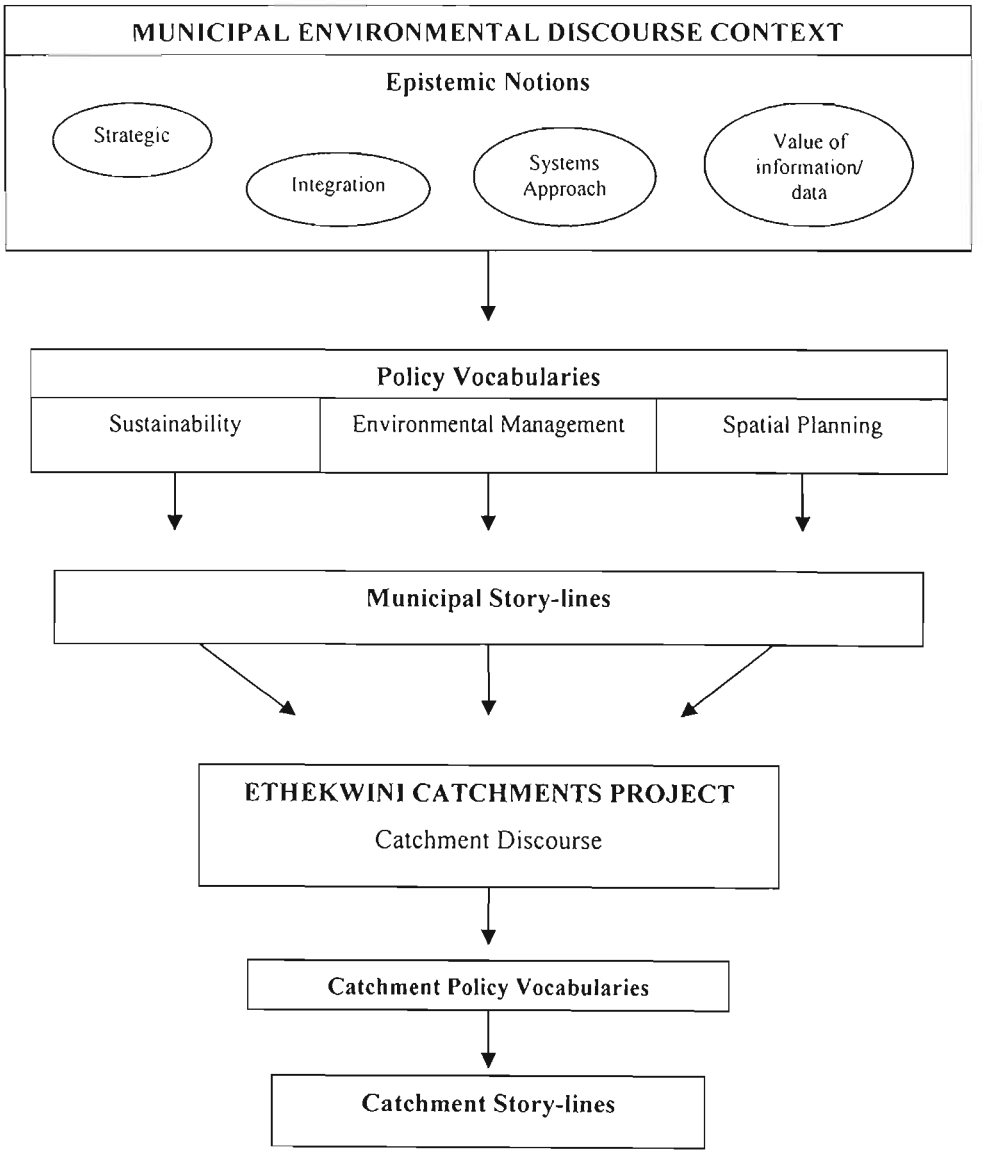

Figure 5.1 Environmental discourse context of the eThekwini Catchments Project

5.3.1 A Strategic Approach

Almost all of the municipal officials interviewed referred to the need for a strategic approach to planning and development, and for strategic direction to guide decision-making. As one official argued, "resources and hard level decision-making are required from our decision-makers in terms of strategically what they think it is that they're doing" (Respondent 3, Environmental

Management, 2003). Apart from using strategic terminology explicitly, officials used words such as 'metro level', 'big city vision', 'the big picture', 'a helicopter view' and 'broad perspective'. They also drew attention to the importance of the Spatial Development Framework and the IDP as the key strategic documents guiding the city's development – "The Spatial Framework and the IDP document is starting to make some of the difficult choices" (Respondent 2, Urban Strategy, 2003). Since most of the officials interviewed were either members of the Spatial Theme Group, which was tasked with strategic spatial planning for the city, or were in positions which required a strategic perspective, the use of strategic terminology is perhaps unsurprising.

5.3.2 Integration

Linked to the need for a strategic approach, the importance of integration was highlighted by most of the municipal officials. Integration is linked to the concept of holism, essentially defined as the whole is greater than its parts (Barrrow, 1999). Holism seeks to "understand the totality of problems rather than their components" (ibid: 131). In the city, integration can be interpreted in different ways, as the Municipal Manager (Respondent 12, 2003) commented - "Integration is important, but integration means different things". It can mean integration between the strategic planning and implementation levels of the municipality – "...we tried to close the gap between just formulating policy and ... the coal front. So we tried to get involved at implementation, to make it feed back into policy" (Respondent 1, Urban Strategy, 2003). Integration also means co-ordination, so that line-function departments work together to align sectoral planning and implementation - a key element of the IDP. From a spatial planning perspective integration refers to the cohesion and functional linkages within local communities in a particular area – "You have to look at a community as a whole, especially trying to integrate communities with other communities, ... the main crux of the city trying to implement their ... IDP" (Respondent 6, Development Planning, 2003). Whatever integration means for different municipal officials, however, it has a strong influence in framing municipal policy and practice.

5.3.3 A Systems Approach

A dominant way of understanding and operationalising integration is to take a systems approach (Hooper et al., 1999). While not all of the municipal officials interviewed referred directly to systems, a systems approach is one of the municipality's key organising principles. This is reflected in their descriptions of the natural environment – 'the river system', 'a natural system', 'ecosystem', 'open space system' – as well as man-made infrastructure – 'the bulk system',

'reticulation system', 'stormwater system'. The city also develops and maintains a number of systems to perform its functions, including 'GIS systems', the 'Land Use Management System', 'information systems', 'the Sustainability Management System', to name a few. Even the city has been defined as a system, requiring a strategic and integrated approach to its management –

> "... we need a city-wide understanding in terms of what we're trying to do, ...we need to have a geographical understanding of how these catchments in this case fit into the sustainability of the system as a whole" (Respondent 12, Municipal Manager, 2003).

A systems approach draws from systems theory, which defines a system as "a set of components that interact with each other" (Clayton and Radcliffe, 1996). Systems theory emphasises the connections between objects or events, as much as understanding the objects and events themselves. A systems approach is reflected in ecosystem theory, which defines an ecological system as "a community of organisms and their physical environment interacting as an ecological unit" (Barrow, 1999: 170). A system is therefore a set of linked components. Since linkages are often not direct, it is useful to conceptualise a system as a web or network (ibid). Systems theory has been applied across a broad range of contexts as a way to understand, integrate and manage the complexity of relationships between phenomena. It is particularly the management aspect of the systems approach that is important, in that it attempts to reduce complexity and bring coherence to complex situations. Systems provide 'a multi-dimensional framework in which information from different disciplines can be integration (Clayton and Radcliffe, 1996). The dominance of this epistemic notion in the municipality illustrates its usefulness as a way to promote integration in a range of spheres of responsibility.

5.3.4 Value of information or data

The final epistemic notion assigns a key role to data or information in guiding municipal policy and decision-making. Across the board, municipal officials stressed that up-to-date and accurate data was essential to ensure appropriate strategic decision-making and to perform their functions effectively. An example is this statement (Respondent 7, LUMS, 2003) -

> "I'm a very strong believer in facts, data, because too often we make judgements based on our best guess, our instinct, our gut feel, our experience. ...I'm not saying planners should stop relying on that, but we also need to start depending on some real facts and figures. There are too many big unknowns".

Municipal officials focused on the need for technical or scientific data, which would feed into appropriate databases, information systems, models or GIS systems. Words such as 'technical information', 'datasets', 'baseline', 'figures', 'GIS layers', 'outputs', and 'units of measure' all reflect this focus on technical data. Beyond just collecting data, the Municipal Manager stressed the need for a strategic approach to data collection. A great deal of time is spent "collecting data and very little time understanding the quality of that information and more importantly, what that information should be used for. So it never becomes more than just data, it never becomes a knowledge base..." (Respondent 12, Municipal Manager, 2003). He therefore asked the question – "are we doing as much thinking as we are doing collecting?" (ibid). A more strategic approach was suggested by the use of data for monitoring progress and change over time, using tools such as indicators and 'performance yardsticks'.

An interesting point is that the use of a database or information system approach could be considered as an appropriate way to reduce the need for communication between sectors within the municipality, as reflected in these comments – "... we don't need to interact with them if we've got their layer on our system" (Respondent 11, Housing, 2003), and

> "I want to get flexibility in the system ... the ability that I can interrogate, depending on whether I'm looking at that micro level or the macro level, whether I'm looking spatially or sectorally, whether I'm looking temporally or a slice-in-time kind of thing, whether I'm looking at rich or poor whatever, I'm able to use the same database to interrogate different options" (Respondent 12, Municipal Manager, 2003).

While this focus on technical, factual information pervades the municipality, there is some attention being given to the need to share information with the local community, and for community concerns to be fed back to the municipality. This was particularly evident in the IDP process that involved the public widely through workshops and ward-based public meetings. Communication with local communities is a key element of the Drainage and Coastal Engineering Department's organisational restructure along catchment management lines. The Department will shortly appoint Catchment Co-ordinators to "talk to communities and basically co-ordinate things. And feed information up and down" (Respondent 10, Drainage and Coastal Engineering, 2003).

In general, these key municipal epistemic notions reflect the EM discourse. EM promotes integration between disciplines and government functions as demonstrated by the city's strategic approach to encourage integration in city development. The use of systems language

and tools to carry out a range of municipal functions also reflects EM, particularly the use of systems ecology concepts in environmental management. The instrumental rationality of the municipality is illustrated in its focus on technical data in decision-making. This aligns well with the techno-managerial approach of EM which contends that with adequate information environmental impacts can be managed and controlled. Municipal officials tend to place a higher value on factual data, as opposed to seeking the input of the wider community. Some officials did refer to the importance of community participation in city management and development, which reflects an aspect of strong sustainability. However, in general the communicative rationality of the strong sustainability discourse is submerged by a focus on factual scientific information, which is characteristic of an EM approach.

5.4 Municipal Policy Vocabularies

Policy vocabularies are the concepts consciously developed by policy makers that structure a particular policy (Hajer, 2003). A review of the policy vocabularies used by the municipal officials interviewed gives an indication of the key policy areas or fields which most strongly influence their work and thus their handling of environment-development issues. The most dominant policy vocabularies can be grouped into three broad policy fields – sustainability/sustainable development, environmental management and spatial planning. Apart from the engineering officials, these policy fields align with the planning and environmental management training of most of those interviewed. However, the scope for engineering vocabularies to be revealed in the interviews may have been affected by the nature of the interview discussions which focused on environmental management and planning issues related to the eThekwini Catchments project. The policy vocabularies are summarised in Table 5.1 below, and have been divided into policy concepts or principles, and their associated tools and approaches.

The sustainability or sustainable development policy field was strongly reflected in the discourse of the Municipal Manager, Environmental Management officials and almost all of the planners. Exceptions were officials with more clearly defined developmental functions (Transport, Drainage and Coastal Engineering, Housing and ABM). The concept of sustainability or sustainable development is pro-actively promoted by the municipality in its IDP as the guiding principle for municipal decision-making, as discussed in Chapter 3. It is therefore not surprising to find it reflected strongly in the discourse of municipal officials. The officials interviewed also referred to a number of tools and initiatives to encourage and measure

sustainability, including the city's Sustainable Management System, Local Agenda 21 and sustainability indicators.

Table 5.1 Key municipal policy vocabularies

POLICY FIELD/AREA	POLICY VOCABULARIES	
	CONCEPTS/PRINCIPLES	TOOLS/APPROACHES
Sustainability/Sustainable development	Sustainability Sustainable development Environmental sustainability	Sustainability Management System Local Agenda 21 Sustainability Status Quo Analysis Measures of sustainability Sustainable Development Plan (in IDP)
Environmental Management	Natural system, resource base Ecological processes Ecological biodiversity Conservation/environmental value Development footprint Development threshold Environmental impacts Cumulative impacts Quality of life, environmental health Risk, hazard Resource economics concepts Internalisation of costs Win-win situation	Environmental Management System Environmental policies Coastal planning and management Strategic Environmental Assessment State of Environment Report Environmental atlas Monitoring Indicators Environmental Management Plans Environmental Impact Assessments, Scoping reports Cost-benefit analysis Environmental design
Metropolitan Open Space System (sub-policy field of Environmental Management)	Open space, open space asset Open space planning Durban Metropolitan Open Space System Environmental asset, natural assets Environmental/ecosystem services	
Spatial Planning	Urban containment, densification, compact city, consolidation Urban edge, infrastructural fence Nodes and corridors Areas, space, spatial issues Land use management	Spatial Development Framework Land Use Management System Plans, town planning schemes Planning procedures and processes Development control

Policy vocabularies reflecting the environmental management policy field were drawn on and used by all officials interviewed, although the Environmental Management officials and planners working at an implementation level (i.e. LUMS, Development Planning and ABM) used a wider range of these vocabularies. The Environmental Management Branch officials focused on urban ecology and biodiversity, resource economics, and open space planning concepts. They drew attention to both strategic and site specific environmental management

tools – such as environmental management systems, indicators, cost-benefit analysis, EIAs and EMPs. Those planners working at an implementation level focused on concepts relating to development impacts, such as the 'development footprint', but also illustrated a strong awareness of environmental concepts such as biodiversity and biospheres, and the D'MOSS concepts of environmental assets and services. They also mentioned both strategic and site-specific environmental management tools.

The strategic planners in the city (Urban Strategy, IDP and the Municipal Manager) concentrated on strategic environmental issues and tools, such as cumulative environmental impacts, SEA and indicators, although in general they drew on broader sustainability policy vocabularies. In contrast, the developmental sectoral officials (Housing, Drainage and Coastal Engineering and Transport) drew on environmental concepts relating to environmental impacts, risks and hazards, but aimed at finding solutions and alternatives. They also showed an understanding of D'MOSS concepts, particularly environmental services. EIAs, indicators and the use of environmental information on GIS were the key tools mentioned. It is interesting to note how the environmental policy vocabularies of municipal officials varied depending on their key functions. Different concepts and tools were drawn upon relative to their understanding of environmental management and their functional needs in the municipality.

In contrast to environmental management, the policy vocabularies of the spatial planning policy field were not as widely represented in the discourse of municipal officials, although they were used by planning and non-planning officials. Planning concepts such as 'urban containment' and the 'urban edge' were used by the strategic and LUMS planners, as well as by Environmental Management and Transport. These concepts have particular relevance to the latter two, because of the implications of urban densification on their functional areas. These concepts are embodied in the Spatial Development Framework (SDF), which was mentioned predominantly by the planning and Environmental Management officials. Planning tools and procedures tended to receive more attention than the planning concepts, such as LUMS, existing town planning schemes, and regulatory planning procedures. This may illustrate some of the difficulties experienced by non-planning officials in grappling with abstract planning concepts, as opposed to the more practical and site-specific planning procedures.

In addition to these three key policy fields, it is worth mentioning those policy fields that are more narrowly represented by the officials interviewed, as summarised in Table 5.2 below. Firstly, most officials expressed community participation policy vocabularies in a general sense.

However, the use of vocabularies calling for higher levels of participation and social justice, such as 'community ownership' and 'community perspectives' were expressed exclusively by Respondent 1 (Urban Strategy) and Respondent 8 (ABM). Secondly, policy vocabularies relating to engineering and development were used by the officials representing Housing, Drainage and Coastal Engineering, and Transport. Predominant were cost-related policy vocabularies concerned with the economic viability of development projects. Lastly, stormwater management policy vocabularies were drawn on by Drainage and Coastal Engineering, including catchment concepts which will be discussed further in Chapter 6.

Table 5.2 Secondary policy vocabularies

Policy Field	Secondary Policy Vocabularies
Community participation	Public consultation and involvement Stakeholder participation processes Environmental education, awareness Capacity-building Community ownership, buy-in Community perspectives Social justice
Engineering and Development	Infrastructure - bulk, platform Infrastructure capacity, planning Engineering solutions, measures Geotechnical issues Project management Cost-benefit analysis Cost comparisons Financial and social viability Cost recovery
Stormwater management	Concepts - network of rivers, stormwater systems Stormwater run-off, erosion, sedimentation, siltation Water users, water providers Flooding risk, hazard Floodline issues Catchment concepts Tools - Master drainage plans Water detention facilities Catchment tools

As with the municipal epistemic notions, the EM discourse tends to dominate the policy vocabularies used by the municipal officials. EM's core concept, sustainable development is reflected, particularly through the use of terms such as 'sustainable systems' and 'measures of

sustainability' which align with the managerial aspect of EM. Most dominant were the environmental management policy vocabularies which indicate a focus on the biophysical environment and technical approaches for environmental management. Systems ecology and resource economics concepts, reflective of EM, were also prevalent. Planning vocabularies too focused on a management approach to development. While officials did express community participation policy vocabularies, the strong level of participation and empowerment envisioned by the strong sustainability discourse was limited. These policy vocabularies provide some of the key concepts and structuring elements for the municipality's story-lines. The alignment of the policy vocabularies with either of the EM or strong sustainability discourses is therefore illustrated more clearly in the discussion of the story-lines in the next section.

5.5 Municipal Story-lines

According to Hajer (1993, 1995) a policy discourse is composed of a number of story-lines. Due to their multi-interpretability and simplification of a particular issue or problem, these story-lines can have the power to draw together a group of actors, often with diverse perspectives and interests (ibid). The existence of such discourse coalitions give power to a discourse through its use and reproduction in speech and written text. Hajer's (2003) framework for policy discourse analysis is designed to analyse the story-lines and discourse coalition associated with a single policy discourse, in Hajer's case the discourse of nature development. While it was a fairly straightforward process to analyse the catchment discourse in this manner, the analysis of the broader environmental discourse context was a little more complicated. This was because the analysis identifies a multiplicity of municipal story-lines which in turn relate to a number of discourses. This corresponds with Foucault's contention (in Sharp, 1999) that many overlapping discourses operate at any one time in an institutional context. The relationships between discourses are complex and constantly changing. Consequently, identifying the discourses to which these story-lines 'belong' was not a straightforward task.

One way of providing a discursive 'home' for the identified story-lines was to link them with the key policy fields discussed in section 5.3. Many of these story-lines have originated out of one or other of the identified policy fields – sustainability, environmental management, or spatial planning. It was therefore possible to identify associated sustainability, environmental management or spatial planning discourses underpinned by specific story-lines. These policy discourses have been used to group municipal story-lines, and at least identify the policy fields from which story-lines originated. Story-lines which do not align clearly with any of these three discourses are discussed separately.

A key feature of story-lines, as defined by Hajer (1995), is their multi-interpretability, and the fact that they consist of a combination of elements from different domains. Thus story-lines cannot be limited to one policy field or policy discourse. While they may originate in a specific policy field, story-lines may also be drawn on by actors representing other policy fields. In fact, the more powerful a story-line, the more it is drawn on from a wide group of actors and their respective policy fields. For example, to state that a spatial planning story-line only represents the spatial planning discourse in fact defines it too narrowly, because once it is drawn upon by other non-planning sectors, its meaning can change to suit other contexts. Story-lines can therefore represent and even uphold two different discourses at the same time, but in different ways. The following discussion attempts to explore some of these complexities. Instances where story-lines reflect an alternative discourse or policy field will be discussed to illustrate how story-lines can be used in different contexts in the municipality.

5.5.1 Sustainability Story-Lines

Sustainability has been conceptualised as a policy field, a discourse and a story-line. Hajer (1995) defines sustainability as the key global story-line underpinning the discourse of ecological modernisation. In the eThekwini municipal context, sustainability is one of the key strategic discourses being advocated by municipal leadership, in particular the Municipal Manager. Sustainability is not intended to be an 'add-on' to municipal strategies and functions, but is intended to underpin all municipal activities and decision-making - it is the "life breath of the IDP" (eThekwini Municipality, 2003a: 6). The key question is whether the sustainability discourse is being institutionalised. In other words, is the sustainability discourse moving from a conceptual policy level to being appropriated by municipal officials in such a way that it guides their day-to-day work and decision-making?

Discourse analysis revealed several story-lines reflecting and supporting the sustainability discourse. These were used predominantly by officials working at a strategic planning level, who had been closely involved in the preparation of the IDP and SDF, as well as those whose core job functions centred on sustainability, such as the Environmental Management Branch. However, the sectoral development-orientated officials did not explicitly use sustainability story-lines, making more use of environmental management story-lines.

The main sustainability story-lines identified are:

- **Social, economic and environmental aspects need to be balanced in development** – This story-line reflects one of the most common definitions of sustainable development, showing three interlinked circles of the environment, economy and society. Statements such as "...sustainability, which is about economy, environment and society, with a dash of politics thrown in..." (Respondent 12, Municipal Manager, 2003), and "what (we) tried to write into the IDP was just much broader sustainability issues ... stretching from the open space asset through to public works programmes and employment" (Respondent 2, Urban Strategy, 2003) show how this story-line is being appropriated by municipal officials.

  In relation to the Catchments Project, this sustainability story-line was specifically drawn on by Respondents 1 and 5 (Urban Strategy and IDP) to stress the need for social and economic aspects or indicators in addition to the biophysical indicators. It was argued, for example, that "we will need to add value to this by doing the social and economic indicators at some point, so then it gets nice and holistic" (Respondent 1, Urban Strategy, 2003); and

  > "Isn't there in a sense a missed opportunity in that...we talk about sustainability in its broadest sense, right, but when we have phase one, which is looking at biophysical, and then sometimes we fail to pick up, because there's not enough aggressive marketing to pick up the other two issues" (Respondent 5, IDP, 2003).

  The use of this sustainability story-line indicates that certain municipal officials are aware of the need for a balanced approach to development, with equal attention being given to social, biophysical and economic issues. However, as illustrated by the above quote, there is still a tendency for sustainability to be interpreted in a way that focuses more on the biophysical or economic aspects, while neglecting the social dimensions, reflective of an EM approach to sustainability.

- **Sustainability requires efficiency and improvement in the way that municipal functions are carried out** – Municipal performance is a key element of the IDP and a performance management system is being established to ensure that the municipal plans are carried out as intended. This story-line therefore links performance management with sustainability discourses, as reflected in these statements defining sustainability: "It's trying to do things better than we are currently doing them, and look for opportunities for that kind of thing to happen" (Respondent 2, Urban Strategy, 2003); and "It's a process. It's about

doing the best you can with the resources available. It's actually probably not more complex than that..." (Respondent 3, Environmental Management, 2003). Current efforts to ensure the efficient use of land, facilities and resources in the city, indicate the institutionalisation of this interpretation of sustainability. An example is the Spatial Development Framework which encourages the development of a compact city to maximise the use of existing services and to minimise development costs. Again, this story-line focuses on one aspect of sustainability and EM – the economic efficiency and cost-effectiveness aspect – neglecting this time, the social and environmental aspects.

- **Economic growth can be generated from waste** – This story-line was expressed in relation to a municipal agriculture project that is using water from a sewage treatment works as fertiliser - "...now there is a project which is sustainability at work because you are creating wealth from a waste product" (Respondent 2, Urban Strategy, 2003). A key aspect of EM is reflected in this story-line – the economic benefits of recycling and reusing waste.

- **Local Agenda 21** (LA21) – Using the words 'LA21' or 'Agenda 21' has become synonymous with sustainable development, and in particular the public participation element of sustainability. As Respondent 1 (Urban Strategy, 2003) argued, in a discussion about community participation, "Planning processes must be your Agenda 21 processes". Respondent 3 (Environmental Management, 2003) focused on the environmental management system aspect of LA21 – "in order to achieve the Local Agenda 21 mandate, we need an environmental management system for this Council". LA21 as a story-line can therefore align with both environmental management and community participation discourses. Consequently, depending on its interpretation, this story-line reflects aspects of both the EM and strong sustainability story-lines.

- **Sustainability requires the development of environmental management systems and tools** – A managerial approach to sustainable development is embodied in the range of tools and management systems that have been developed to manage environmental impacts and encourage sustainability, such as environmental management plans, ISO 14000, sustainability management systems (SMS) and indicators. The municipality's SMS embodies this approach, as illustrated in this statement – "...we realised that no one was doing the sustainable development thing, and so we ... stepped out there very boldly and said "Ok, well we'll do it". So we developed the Sustainability Management System" (Respondent 3, Environmental Management, 2003). This sustainability story-line therefore

links well with the environmental management discourse and its story-lines. As such it reflects the techno-managerial aspect of EM which perceives environmental protection as a management problem (Hajer, 1995).

- **The key to sustainability is institutional will** – Expressed by Environmental Management, this story-line contends that appropriate institutional structures, political will and support is required if sustainability is to be achieved. As Respondent 3 (Environmental Management, 2003) argued,

  "The only thing that's almost key to sustainable development is the institutional strength and will. Without that none of it works. The problem is that institutionally the stuff needs to be taken on board and resolved through decision-making - that's the missing leg of sustainable development, that fourth institutional thing".

  This story-line raises the issue of governance, the political aspect of sustainable development, the importance of which is often underestimated. As will be shown in Chapter 6, institutional will and support plays a key role in discourse institutionalisation.

- **Planning encompasses sustainability** – this story-line shows how the planning policy field has been influenced by the sustainability discourse. Respondent 2 (Urban Strategy, 2003) in particular stressed how planning initiatives in the city promoted sustainability:

  "For me, planning is about sustainability issues";

  "And this whole concept of an urban edge and urban containment ... were basically all around sustainability"; and

  "the SDF is the embodiment of sustainability good practice".

  Further discussion of the planning story-lines in section 5.4.3 will show how the sustainability and planning story-lines complement each other. It is the planners in particular who have appropriated the sustainability story-lines, partly due to the nature of the planning profession which promotes a strategic and integrated approach to development.

As discussed in Chapter 2, sustainability can be interpreted in any number of ways. This small sample of municipal officials' statements shows how, even within a narrow group of actors with similar professional backgrounds and shared orientations, sustainability has been given different meanings. As Respondent 3 (Environmental Management, 2003) commented, "I don't think

anyone interprets sustainability. I think sustainability is a great myth". Whichever way it is interpreted, sustainability is being used as the chief discourse for motivating positive change on all fronts in the eThekwini Municipality. It is important to note, however, that these story-lines, and the ones to follow, indicate that municipal officials do not integrate the three aspects of sustainability in an equitable way. One aspect, usually the economic or biophysical, tends to be given more attention. While this is probably due to the specific sectoral responsibilities of municipal officials that focus more on one aspect than another, it illustrates how difficult it is to ensure that all aspects are considered equally. Overall, it is the social aspects, representing the strong sustainability discourse, which usually receive the least attention.

5.5.2 Environmental Management Story-lines

Environmental management discourse turns the focus of sustainability towards the biophysical environment, with an emphasis on how development impacts on the environment are to be managed. The use of environmental management policy vocabularies by a range of municipal officials, and their use of environmental management tools in practice indicate that environmental management approaches are becoming entrenched in the municipality. Officials also use a number of environmental management story-lines, indicating that the institutionalisation of the environmental management discourse is taking place. The managerial and biophysical focus of the EM discourse therefore plays a key role in environmental decision-making. Key environmental management story-lines identified are:

- **The environment needs to be protected and managed** - This broad story-line was identified explicitly or implicitly in the discourse of all the municipal officials interviewed. Apart from Environmental Management officials, the story-line was predominantly used by officials working at an implementation level (Local Planning, ABM, Housing, Drainage and Coastal Engineering and Transport). It shows that at a broad level, municipal officials recognise the importance of the environment and the management of development impacts. Statements reflecting this story-line include the following –

  "I think each of us have got a responsibility to the environment" (Respondent 9, Transport, 2003);
  "(we are) certainly very supportive of what Environment are wanting to try and do" (Respondent 10, Drainage and Coastal Engineering, 2003); and
  "I understand the environment is important and we need to preserve that", and "We don't want to touch environmentally sensitive land" (Respondent 11, Housing, 2003).

At a practical level, this story-line relates to the need to manage development impacts –

> "It's those cumulative impacts which are greater in big cities like this than they would be in smaller environments, where you know the environment is big enough and patient enough to accommodate the impacts we make" (Respondent 12, Municipal Manager, 2003);
>
> "I think that approach in a certain small core of planners here has now become more widely spread, and we automatically think now, 'Ok, what's the environmental impact here? What's the environmental dimension to this intervention that we're doing?'" (Respondent 7, LUMS, 2003); and
>
> "we were thinking more of the management approach to the environment...You're trying to redeem an environment that there's a big footprint, that's already in place, but that has a direct impact ..." (Respondent 8, ABM, 2003).

This story-line is also reflected in a range of institutional practices in the municipality relating to environmental management. These practices are not restricted to the Environmental Management Branch. A few examples are:

1. EIAs and EMPS are becoming common practice in development sectors of the city;
2. Development Planning and Management planners consistently use environmental principles when assessing development applications;
3. Environmental issues are being integrated into the revision and extension of town planning schemes;
4. The new ABM programme is specifically developing environmental management interventions as part of its area management mandate; and
5. The Drainage and Coastal Engineering Department has proposed an 'environmental arm' as part of the organogram for its new Unit, recognising the need for environmental professionals to be involved in catchment management.

Consequently, in the discourse of municipal officials and in the city's institutional practices, the environmental management story-line has achieved a high degree of credibility and acceptability. This may be partly due to the fact that environmental management is legislated through the EIA regulations and NEMA. However, it indicates that the managerial and biophysical focus of EM has been strongly appropriated by the municipality.

- **The environment is the basis of development** – This story-line goes a step further than merely recognising the importance of the natural environment, arguing that the environment

is the foundation of economic, social and physical development. As explained by Respondent 3 (Environmental Management, 2003), "... resource economics concepts ... reiterate something we feel was very important, that the environment is the basis of development, that it is the foundation, and that you cannot develop the city without taking that on board". This story-line was reflected in the discourse of a smaller group of municipal officials – Environmental Management, Development Planning, and Drainage and Coastal Engineering. As Respondent 6 (Development, 2003) stated,

> "... in the past your environmental issues have always taken a back seat in everything. And now to come and put environment up front ... is not just a learning curve, but also a change of mindset of the people out there. But I think it's something that's slowly climbing up the ladder, and being slotted in on top now".

Placing environment at the centre conflicts to some extent with the sustainability story-line which perceives the environment, economy and society in balance. The difference between these two story-lines is illustrated in this statement, which argues for a balanced sustainability approach:

> "there seems to be a lot of energy in saying let's put environment at the centre of the equation and measure everything in terms of environment. You get another approach that says, let's put the economy at the centre of the equation and then let's measure everything in terms of the economy. ... And the problem with that, as a person from a Marxian background, that's not dialectical. ... Unless you begin to unpack what those key relationships are, you end up with difficulty" (Respondent 12, Municipal Manager, 2003).

An important point here is that while in word EM promotes a balanced version of sustainability, in practice EM focuses on the economic and biophysical aspects, to the detriment of social justice and related issues. These story-lines illustrate that in general an unbalanced interpretation of sustainable development is evident in the municipality.

- **The profile of the environment needs to be raised** – The main contention of this story-line is that by creating greater awareness, there will be greater support for the environment and its protection and management. Reflected in the discourse of just three municipal officials (Urban Strategy, Development Planning and ABM), this story-line calls for "initiatives which will elevate the role of the environment in people's and councillors' eyes"

(Respondent 2, Urban Strategy, 2003). "It's a matter of starting to ring the bells out there, and to get to tell people out there that the city is starting to get serious about the environment" (Respondent 6, Development Planning, 2003). Such initiatives include environmental education and awareness, one of the Environmental Management Branch's key strategies.

However, this story-line can also be interpreted as going beyond formal environmental education approaches to include those which recognise that poorer communities are more likely to develop an appreciation for the environment if they are shown the direct benefits (for example, economic benefits) to themselves. For example,

> "if you say you're taking care of the environment but people can see direct benefits, spin-offs, ... just the wage they're going to earn, it's easier for them to see why should see this as an asset...If somebody doesn't have a direct relationship, you're building that relationship with the environment and it's a personal relationship beyond just being told by somebody" (Respondent 8, ABM, 2003).

This interpretation of the story-line argues that top-down or managerial approaches to environmental education are not necessarily appropriate in community contexts. More practical initiatives are needed, such as "getting involved in the muti trade and the cultivation of muti plants to show the value of the indigenous vegetation to wealth creation and filling people's stomachs. ... Find a way that people say yay to the environment" (Respondent 2, Urban Strategy, 2002). This interpretation therefore aligns well with the community participation policy field and discourse. Its focus on the active involvement and empowerment of the community in this way also reflects elements of the strong sustainability discourse.

- **The capacity of the environment to receive development is limited** – The key argument of this story-line is that there are some "absolute constraints to development in a locality, beyond which one cannot go without unacceptable change occurring" (Rydin, 1998a: 746). The concept of environmental carrying capacity originates in the ecological and biological sciences, which argues that ecosystems have finite limits to support different species (ibid). Although it is a scientific concept, it is in fact extremely difficult to measure or quantify the carrying capacity of a particular region, ecosystem or catchment. Nonetheless the carrying capacity concept, referred to by Rydin (1998a) as the discourse of limits and constraints, is well accepted in environmental science.

This environmental limits story-line was used mainly by Environmental Management officials, although it is also reflected in the discourse of certain planners and the Transport representative relating to catchments, as illustrated later on in Chapter 6. Using terminology such as 'stressed' and 'limitations', this story-line is reflected in the following statements made by Respondent 3, Environmental Management, 2003:

> "[the city's] resource base ... is a very functional resource base; but ... it offers up a range of limitations and opportunities"; and
> "I think one of the key challenges we're facing ... is that the Ohlange catchment is stressed. We've just found out that the input of the wastewater into that estuary is degrading that estuary. It's going to have to be transferred across catchment".

As argued by Jacobs (1997, cited in Rydin, 1998a), from a social constructionist perspective, capacity constraints are not set by nature and science, but by social judgements relating to how different aspects of the environment are valued. This relates to what land use changes are tolerable and which are not. He argues further that rather than being determined by science, capacity constraints should be determined in a participatory manner though the involvement of local citizens (ibid). This discussion illustrates that the instrumentalist and technical nature of this story-line, which seeks to place absolute quantifiable limits on development, aligns with the EM discourse. An alternative approach as proposed by Jacobs would reflect strong sustainability.

- **D'MOSS story-lines** – The Durban Metropolitan Open Space System (D'MOSS) discourse is probably the city's key environmental management discourse.[8] The Environmental Management Branch has consistently worked to gain support for this environmental policy discourse and its associated story-lines since the original D'MOSS Plan was introduced in 1989. The D'MOSS discourse has evolved over the years and currently consists of a mix of its original story-lines, as well as new story-lines drawing from resource economics which frame the recent Environmental Services Management Plan (eThekwini Municipality, 2001a). D'MOSS story-lines and policy vocabularies were reflected in the discourse of many of the officials interviewed - environmentalists, planners and engineers – although mostly from those officials working at an implementation level. However, D'MOSS has

[8] While the city's most recent open space policy document is called the Environmental Services Management Plan, municipal officials still refer to D'MOSS, hence naming this the D'MOSS discourse.

not been without its critics and is still not accepted in all quarters of the municipality – an 'anti-D'MOSS' story-line can therefore also be identified.

Using the term 'D'MOSS' invokes a certain approach to environmental management based on the protection of a system of open spaces in the city. 'D'MOSS' therefore acts as a metaphor for open space conservation in the city. It also serves as a metaphor for the environment in general or for green issues. For example, when talking about raising the profile of the environment, Respondent 6 (Development Planning, 2003) stated that "...all we really could do at this stage was to advertise the D'MOSS plan simultaneously when we advertised our zoning plan, but that the D'MOSS would be a layer. And then, by doing that, you are starting to warn people that there is this environmental layer". When the Housing Department is searching for suitable land for housing development, the key environmental issue to take into account is the 'critical' D'MOSS areas which have been identified for conservation (Respondent 11, Housing, 2003). It is important to note here that the city's D'MOSS approach originated out of the Manager of the Environmental Branch's doctorate on the subject, hence the strong emphasis on D'MOSS. The Environmental Management Branch even admits that its LA21 programme has been misconceived as a 'green' programme, due to its vocal championing of open space protection (Roberts and Diederichs, 2002). The D'MOSS discourse therefore has tended to dominate other environmental management and sustainability discourses being developed in the city.

A number of story-lines underpin the D'MOSS policy approach, as outlined in the ESMP (eThekwini Municipality, 2001a). The intention here is to draw attention to only the key story-lines, in particular those which are being drawn on by a wider group of municipal officials than just the Environmental Management Branch. These D'MOSS story-lines include:

Open spaces are an asset to the city and need to be protected - This story-line conceptualises open spaces not as wasted, unused or dangerous pieces of land, but as assets to the city. As argued by Respondent 2 (Urban Strategy, 2003), "...people need to realise the value of that asset but you need to build the profile of the environmental asset ...you show the value in monetary terms of open space to people". While this story-line was not explicitly used by many officials, the policy vocabularies of 'environmental asset' or 'open space asset' were more widely used. The term 'asset' has interesting connotations, drawing as it does from resource economics which uses financial terminology to give value to the

environment. This story-line thus strongly reflects an EM approach which uses economic concepts and tools to value the environment.

Open spaces provide valuable environmental services to the city – Also drawing from resource economics, and thus reflective of EM, this story-line focuses on the economic value of the services the environment performs. As Respondent 3 (Environmental Management, 2003) explained, resource economics transformed the original open space concept "from something that was potentially white and elitist into something that was a big service provider, was key to the economic viability of the city". Municipal officials appear to have latched onto this story-line because of its practical usefulness, and its use of a language people understand. A financial approach to the environment has provided officials accustomed to counting the costs of development and maintenance of services with a way to 'compare apples with apples'. An example is this statement – "Ja, those studies they've done in eThekwini to actually put a value in rural areas ... for the services that they get from the environment was very useful – an eye-opener". (Respondent 9, Transport, 2003). The IDP also explicitly comments on the value of environmental services to the city in practical and monetary terms (eThekwini Municipality, 2003a). Again, this resource economics story-line aligns strongly with EM.

Catchments are useful units for managing the open space system – this story-line emerged out of the ESMP, which argued that the relationship between the management of natural resources and development planning can be enhanced through a catchment approach (eThekwini Municipality, 2001a). Respondent 4 (Environmental Management, 2003) explained how this approach adds value to open space planning –

> "... the 2001 open space planning stuff that we did picked up on the catchment analysis or approach quite strongly, based on the National Water Act provision for catchment management agencies....we simply find it easier to conceptualise and understand our open space system in bite-size pieces which makes looking for natural ecological boundaries sensible, and those natural ecological boundaries tend to be catchments".

As an approach to D'MOSS, the use of this catchment-oriented story-line was limited to Environmental Management officials. However, it is this story-line which played a key role in the discussions of the Spatial Theme Group relating to the development of administrative areas for the municipality, and which in turn led to the initiation of the eThekwini

Catchments project. This story-line evolved from a D'MOSS story-line to a whole new catchment discourse composed of a number of story-lines, each with a different orientation and understanding of the value of the catchment concept, as will be discussed in more detail in Chapter 6.

To the spectrum of municipal officials interviewed, the D'MOSS discourse appears to have most relevance, firstly, as a metaphor for the environment and the consideration of environmental issues in development. The D'MOSS version of environmental management tends to focus on open spaces rather than the city environment as a whole, and therefore limits the consideration of environmental issues. Secondly the D'MOSS environmental services story-line resonates well with the officials due to its focus on the functional role that the environment plays in providing valuable services to the city and its residents. The 'greener' aspects of D'MOSS such as the protection of open spaces to preserve biodiversity tend to be limited to the Environmental Management officials.

It is also important here to suggest an **'anti-D'MOSS' story-line**, based on the perception that D'MOSS is more concerned about green issues than the socio-economic development needs of the poor. This story-line emanates more from city councillors as suggested by this statement –

> "I got perceptions from my other interactions with Council that there was not very good support for the Environment Branch, because it was mainly protecting the green agenda, and mostly protecting open space. Now open space for the councillors has a very negative connotation, and so, councillors being predominantly black and coming from disadvantaged groups tended to see open space also as part of racism..." (Respondent 1, Urban Strategy, 2003).

This story-line indicates that the D'MOSS discourse is most strongly aligned with EM, as concerns for the protection and management of the natural environment are placed ahead of social needs and issues.

5.5.3 Spatial Planning story-lines

The spatial planning discourse draws from planning theory as well as from legislative requirements and procedures related to forward planning and development control. The four key story-lines identified can be divided broadly into two planning categories – spatial planning and land use planning – although there are linkages between them. Planning story-lines were

used by planning and non-planning officials at strategic and implementation levels, although there were specific areas of emphasis relating to their respective municipal responsibilities. The spatial planning story-lines are:

- **The delineation of spatial areas or boundaries is useful for city management** – A key element of spatial planning involves the development of plans at regional and local level to guide development based on spatial areas. This spatial area story-line is reflected in this statement, "Now the strategic framework is given by the Spatial Development Framework, supporting a hierarchy of plans, like these smaller regional plans, maybe even smaller district plans if necessary..." (Respondent 7, LUMS, 2003). The ABM approach also draws on this story-line, by dividing the city into areas for particular development management purposes. This story-line dominated the discussions of the Spatial Theme Group around administrative areas, as illustrated here –

  > "we were looking at ways of demarcating the city" (Respondent 8, ABM, 2003);
  > "At that time it was around wall-to-wall areas for governance purposes" (Respondent 5, IDP, 2003); and
  > "... ourselves and those other departments were trying to make a case for understanding and dividing up the city in an administrative way that reflected logical boundaries rather than just political boundaries" (Respondent 4, Environmental Management, 2003).

  The spatial area story-line was also relevant to non-planning officials, although conceptualised from their perspective, as illustrated by this statement - "...we simply find it easier to conceptualise and understand our open space system in bite size pieces which makes looking for natural ecological boundaries sensible..." (Respondent 4, Environmental Management, 2003).

- **City development must concentrate on densification of the core areas to promote integration and the efficient use of resources** – This densification story-line is linked to the sustainability story-line which concentrates on efficiency and wise use of the city's resources, whether they be land, infrastructural services or revenue. It thus aligns well with economic efficiency aspects of EM. It draws from 'compact city' planning theory which promotes densification to counteract the inefficiencies and costs of urban sprawl (Todes, 2000). While this story-line was reflected in the discourse of only four of the municipal

officials (planners and sectoral officials), it is one of the key principles underpinning the SDF. The following statement shows how the SDF embodies the densification story-line:

> "The Spatial Framework of the IDP document is starting to make some of the difficult choices about rehabilitating the CBD and the Southern Basin and that immediately forces the issue of starting to limit growth in the north, starting to densify ... instead of the leapfrog development which has been happening" (Respondent 2, Urban Strategy, 2003).

Also reflecting the densification story-line are policy vocabularies such as 'agglomeration of facilities', 'urban containment' and 'compactness'. Of special interest is how this story-line has been appropriated by Transport, due partly to Transport legislation that promotes densification along traffic 'corridors' to ensure the optimum use of transport services (Respondent 9, Transport, 2003). As stated by Respondent 9 (ibid),

> "Fundamental to the IDP as I see it, when you start getting an urban core and an urban edge, and you're wanting development to go in there, that's talking about compactness. So ... one of its underlying principles is densification"; and
> "If we're going to consolidate in the centre, transport must be developed with a plan to take that further".

The use of the densification story-line by Respondent 9 illustrates how a story-line emanating from a specific policy field can be drawn on by external actors, in cases where a story-line's argument (sometimes unconsciously) aligns with other external needs or issues. As discussed by Hajer (1995) and Sharp (1999), the power of story-lines is in their multi-interpretability. The densification story-line is one story-line which has universal appeal and therefore power, as will be illustrated in Chapter 6.

Land use planning story-lines focus on the use of land and the management of that use predominantly using development control approaches and procedures. The first of these story-lines is used by a mix of planners and non-planners while the second story-line is used predominantly by planners involved in land use management. The story-lines are:

- **The use or development of land is a key municipal issue** – Land is elevated as one of the city's principal resources in this story-line, particularly when it relates to meeting the

housing and livelihood needs of the city's population. The value of land for different reasons is shown in these statements reflecting the land story-line:

> For housing provision – "My mandate is to find well-located land for housing" and "Land is a big problem in the municipality, access to land ... there's limited land in close proximity to jobs, to facilities, etc." (Respondent 11, Housing, 2003);
> For meeting livelihood needs – "...people are trying to survive, so they are reliant on land. ... So protection of important soil types and valuable agricultural land is important for those people, because once its lost, it's gone forever" (Respondent 6, Development Planning, 2003); and
> For its scarcity - "Land is the issue in the city, purely because were coastal, 180 degrees, and of that 180 degrees, the bulk of it is deeply incised" (Respondent 3, Environmental Management, 2003).

A major element of this story-line is the interrelatedness of land use, in other words how the use of land in particular ways has multiple effects in the city:

> "the report highlighted a fundamental issue between land use and transport" (Respondent 9, Transport, 2003);
> "... the decision-makers in the Housing and Land Committee and Infrastructure and so on, are all impacting on how land is used in development, right? So if you take land here, then land is not available for this. Or if you use this [land] in a particular way, it has this impact" (Respondent 7, LUMS, 2003); and
> "...when we make decisions on land, it has a ripple effect, it impacts on all other decision makers" (ibid).

This aspect of the land use story-line thus draws on systems ideas in that it recognises the connections and dependencies between activities and phenomena in the city.

- **Appropriate development control measures are necessary to manage land use** – In line with planning legislation, this development control story-line accepts that land use must be managed to ensure appropriate development aligned with the city's spatial strategies. The new Land Use Management System and existing planning tools, such as town planning schemes and development approval procedures, all accord with this story-line. Development control policy vocabularies used by municipal planners reflect this story-line, such as:

"... begin to put in place development, ... zoning and built form, controls" (Respondent 2, Urban Strategy, 2003);
"... the operational framework – the land use schemes, the area statements of intent, the processes for doing this" (Respondent 7, LUMS, 2003, describing LUMS); and
"Your legal processes, how do you go about subdivision, how do you go about rezoning?" (ibid).

The development control story-line links closely with environmental management story-lines and approaches, as it also reflects a managerial approach to development and the environment. Its promotion of land use management tools and processes thus reflects EM's technical management focus.

5.5.4 Social and economic development story-line

One of national government's key discourses promotes the social and economic development of the population, particularly in response to the high levels of poverty and unemployment in South Africa. This development discourse is captured in the Constitutional requirement for municipalities to promote social and economic development and to ensure the provision of services to its communities (RSA, 1996, 152). It is also reflected in the eThekwini Municipality's LTDF and IDP, especially the IDP's Service Delivery Plan and Community Service Plan. In the context of this research, the associated development story-line can be defined as:

Social and economic development issues need to be incorporated into environmental management initiatives – Connecting with sustainability story-lines, a key premise of this story-line is that environmental management initiatives cannot focus solely on the biophysical environment. Equal attention needs to be given to social and economic issues for a holistic approach to environmental sustainability, as reflected in these statements:

"...it's more than about picking up the policy implications from this (biophysical) component – what about the social, what about the economic?" (Respondent 5, IDP, 2003); and
"I think it would be more important if we do the socio-economic aspects and then produce it as a more comprehensive data set" (Respondent 1, Urban Strategy, 2003).

Even though social and economic development is one of the municipality's key responsibilities, this story-line was not widely represented by municipal officials. It was only reflected in the discourse of Respondents 1, 5, 8 and 11 (Urban Strategy, IDP, ABM and Housing). An explanation may be that officials are engaged more at a strategic level with broader sustainability issues, or indeed because the protection and management of the environment and land use management are the core responsibilities of most of those interviewed. Their mandate is therefore to manage development impacts, rather than facilitating social and economic development. However, it does illustrate that the strong sustainability discourse has not filtered down sufficiently from national and strategic city management level to be appropriated by municipal officials.

5.5.5 Community participation story-line

The community participation discourse is based on community development approaches emphasising that the local community must be involved for meaningful development and change to occur in a specific locality. Community participation is a contested term and consequently there are a variety of different approaches to participation, ranging from "communication" and "information-sharing" to "consensus around decision-making" (Respondent 8, ABM, 2003). In an environmental policy-making context, participation can mean environmental education and awareness, through the communication of environmental information, policies and plans. At the other end of the spectrum participation requires collaboration between policy makers and the community, resulting in shared policy outcomes. This type of collaborative participation aligns with deliberative and interactive policy approaches as discussed in Chapter 2.

While community participation policy vocabularies were used by most municipal officials, community participation was not emphasised to any great extent, except by Respondents 1, 2, 8 and 10 (Urban Strategy, ABM and Drainage and Coastal Engineering). The discourse of these respondents reflected one key story-line relating to community participation in the environmental management context, as follows:

Community stakeholders need to be involved in environmental management - This story-line links the community participation discourse with the environmental management and sustainability discourses. LA21 processes strongly reflect this story-line, calling for the involvement of local communities in sustainability and environmental management initiatives. Such an approach aims to ensure the consideration of social issues in balance with economic

and environmental issues, as well as empowering communities to be involved in environmental decision-making that affects them. The Drainage and Coastal Engineering Department's plans to employ catchment co-ordinators to facilitate community feedback align with this story-line – "It'll have to be someone who can talk to communities and basically co-ordinate things. And feed information up and down" (Respondent 10, Drainage and Coastal Engineering, 2003). Contending that the Catchments Project could have been handled differently to involve the local community, Respondent 1 (Urban Strategy, 2003) also drew on this story-line. Community involvement could have uncovered alternative arguments and issues, and led to the identification of other more locally-based indicators. Attempts to "build in community perspectives in building the biophysical database" would have given "a flavour of local components" (ibid).

Beyond contributing community-sourced information to policy-makers, this story-line calls for partnerships and community involvement in environmental management, as indicated in these statements –

> "...you need ... to work to form partnerships in order to protect natural resources..." (Respondent 2, Urban Strategy, 2003);
> "...it's not only the responsibility of the municipality – see how other role-players can add to the management and monitoring" (Respondent 1, Urban Strategy, 2003); and
> "I always thought that it might have moved towards something where you have community-based environmental management" (ibid).

This aspect of the story-line aligns with stronger participation approaches that aim to empower and enable communities to manage their own environments in collaboration with the appropriate authorities. It also links back to the story-line arguing for the need to raise the profile of the environment. By involving people in environmental management and policy development, a relationship can be built with the environment (Respondent 8, ABM, 2003). Development initiatives such as organic farming or flood attenuation projects which directly benefit local communities can be used to build this relationship – "I think if people market your environmental issues partly along those lines, there is value in doing that, other than just saying, 'oh, ja, it's an absolutely green bush and you cannot touch that space'" (ibid). This story-line clearly reflects elements of the strong sustainability discourse in that it calls for the involvement of the local community in environmental management in such a way that empowers individuals.

5.5.6 Development costs story-line

Reflecting the engineering and development policy field and related discourse, this story-line draws attention to the need to balance engineering development with other factors such as environmental impacts and the spatial structure of the city, in a cost-efficient way. This story-line was reflected in statements made by Respondent 9 (Transport, 2003), for example –

> "Obviously, when you've got a catchment that is under pressure and you want to put in new development there, either you've got to increase your costs to provide engineering solutions to deal with things like run-off, waste and all that type of stuff, or that catchment deteriorates further"; and
>
> "... if you want to develop in the Outer West, you've now got to provide new bulk infrastructure, new sewers etc, and there will be huge costs, whereas in the central areas we've got spare capacity, so if you develop here, these will be the costs. So it's a kind of cost comparison" (commenting on a housing costing model developed by the Urban Strategy Department).

This story-line aligns well with the densification story-line which also promotes the most balanced and efficient use of resources to ensure sustainable development in the city. It therefore links as well to the sustainability story-line concerned with efficiency in how the municipality functions and undertakes development, thus reflecting an EM approach to development.

5.6 Prospects for sustainability in the eThekwini Municipality

While the EM discourse is largely orientated towards pro-environment changes in how business and industry operates, a number of aspects of EM can be identified which are directly applicable to the municipal context. These aspects include:

1. A management approach to the environmental problem;
2. A belief in the capacity of modern technologies and techniques to solve problems, and the associated importance of quantitative data representing an instrumental rationality;
3. Sustainable development as its core concept, but with a tendency to focus on the biophysical and economic aspects, while social issues are sidelined;
4. A dominant role for science and scientific experts, using the principles of systems ecology, carrying capacity, and the quantitative measurement of environmental impacts;
5. A focus on cost-effectiveness and efficiency in planning and decision-making;

6. The use of economic concepts, mechanisms and principles, such as resource economics; and
7. An integrated and interdisciplinary approach to environmental management.

The analysis of the terms of policy discourse in the previous sections indicates that municipal environmental discourse reflects all of these aspects of the EM discourse in various ways. The municipal epistemic notions promote an integrated and systematic approach to development and environmental management in the city. The high value given to quantitative data aligns with EM's instrumentalist approach to the environment. Similarly, the municipal policy vocabularies reflect an EM approach. EM's core concept of sustainable development features strongly as the municipality guiding principle in its IDP. Sustainability tools such as sustainability systems and indicators tend to reflect a technical approach to sustainability typical of EM. The environmental management policy vocabularies were most dominant, focusing on the biophysical aspects of sustainability and offering techno-managerial solutions to the environmental problem. Planning vocabularies also tended to focus on a managerial approach to development and land use. However, some hints of strong sustainability could be identified in the community participation policy vocabularies, through terminology such as 'community ownership', 'social justice' and 'community perspectives'.

The municipal story-lines are summarised in Figure 5.2 below, and have been grouped into their respective originating policy fields. For the purpose of this analysis, the story-lines are shown as separate or isolated arguments to illustrate their alignment with EM or strong sustainability. However, in reality there is substantial overlap and connection between story-lines. It is therefore more useful to consider them as a 'web of inter-related story-lines'. Since story-lines underpin broader discourses, this reflects the overlapping and constantly changing nature of discourse (Sharp, 1999). The linkages between story-lines are built on common concepts or interests, for example both the densification story-line and one of the sustainability story-lines are based on the EM concept of efficient use of resources.

Most of the municipal story-lines were dominated by the EM discourse. All of the sustainability story-lines reflected different aspects of EM, such as a management approach to the environment, the need for cost-effectiveness and efficiency, and a focus on the biophysical and economic aspects of development. However, certain sustainability story-lines also reflected aspects of strong sustainability. For example, the importance of community participation and empowerment is embodied in the 'LA 21' story-line.

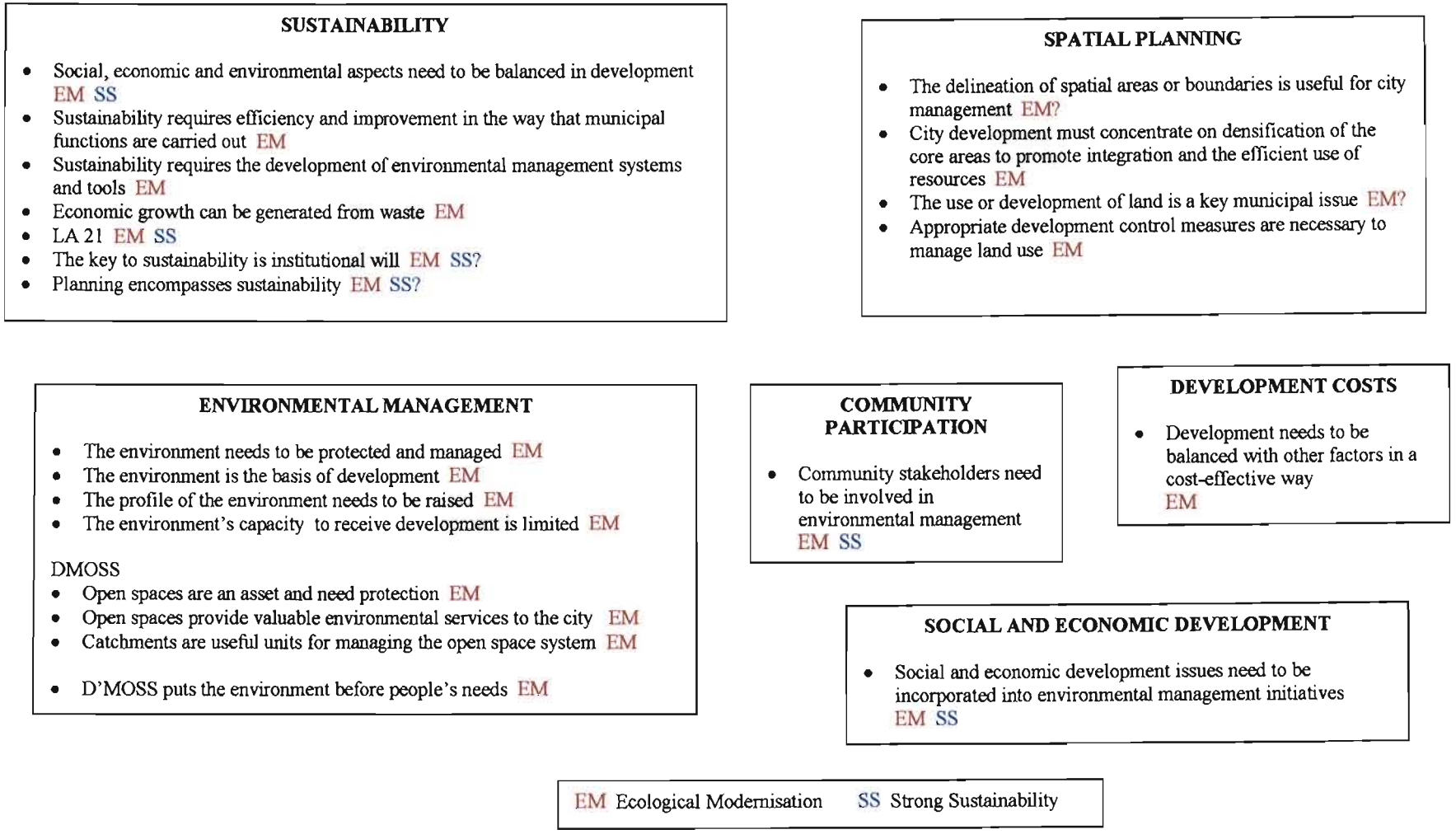

Figure 5.2 Municipal story-lines

It was not always easy to determine if certain municipal story-lines reflected strong sustainability. The last two sustainability story-lines are a little ambiguous in this sense. This may partly be due to the fact that these story-lines are only reflected by a small number of officials. Wider use of these story-lines may have provided more detail to indicate whether they reflected strong sustainability.

Environmental management story-lines however, were clearly representative of the EM discourse. This is reflected in their focus on the biophysical aspects of sustainability and a management approach to the environment. Also characteristic of EM is the use of carrying capacity and resource economics concepts. In general, social issues were poorly reflected, except for one interpretation of the 'environmental profile' story-line which argued for the active involvement and empowerment of the local community to encourage a stronger awareness of the importance of the environment. Two of the spatial planning story-lines - the 'spatial areas' and 'land as a key resource' story-lines - were also difficult to align with either EM or strong sustainability, as they did not clearly reflect aspects of either discourse. However, the 'densification' story-line's focus on city integration and efficient use of resources aligns strongly with EM; and the 'land use management' story-line aligns with the techno-managerial aspects of EM. The development cost story-line also aligns with EM due to its emphasis on a cost-effective approach to development.

Lastly, the 'community participation' and 'social and economic development' story-lines align with both EM and strong sustainability, depending upon their interpretation in different contexts and by different role-players. Community participation has different meanings from simple information-sharing to the empowerment and strong involvement of local people in decision-making. Similarly the incorporation of social and economic issues into environmental management can involve weak or strong participation approaches, representing EM or strong sustainability.

Overall this analysis indicates that the strong sustainability discourse is poorly represented in municipal environmental discourse. This is surprising considering the national legislative framework which promotes many aspects such as social justice, empowerment and social development, as well as the poor social situation of a large section of the city's population. The dominant approach to solving the 'environmental problem' in the city is focused on technical and managerial measures aimed at the biophysical environment, while neglecting the important social dimension to environmental degradation. The key role-players in this approach are the

city and other government officials, with limited attention being given to the key role that the local community can play in improved environmental management and decision-making. This reflects the instrumentalist approach of EM as opposed to the communicative rationality of strong sustainability.

5.7 Conclusion

Using Hajer's discourse analysis methodology, this review of the terms of environmental discourse in the eThekwini Municipality indicates that, although elements of the strong sustainability discourse are present in limited ways, environmental policy making in the city is dominated by the EM discourse. The following chapter explores a new environmental policy discourse, the catchment discourse, which has emerged in the municipality in recent years. This research focuses on one environmental practice, the eThekwini Catchments Project, to explore this discourse, taking into consideration the broader environmental discourse dynamics discussed here. It also considers issues relating to discourse institutionalisation.

CHAPTER SIX: DYNAMICS OF THE CATCHMENT DISCOURSE

6.1 Introduction

The catchment policy discourse evolved within the context of the environmental discourse dynamics in the eThekwini Municipality as described in the previous chapter. Municipal discourse is strongly influenced by ecological modernisation, but there are signs that municipal officials are beginning to draw on elements of strong sustainability in their efforts to move the development and management of the municipality towards stronger sustainability. The question is how this discursive context influences the development of new environmental policy and projects. This chapter explores a new policy discourse, the catchment discourse, which emerged and evolved in three key areas in the municipality - through municipal deliberations on administrative boundaries for the city; in the growing catchment focus of the Drainage and Coastal Engineering Department; and lastly, through the eThekwini Catchments project. Since this research centres on the Catchments Project, the catchment discourse has been analysed from the project perspective, and gives particular attention to the project's catchment approach. However, to ensure that the catchment discourse is fully described, it is also necessary to elaborate on those aspects of the discourse more clearly related to the other two areas.

The chapter is broken into five key sections. Firstly, the role and influence of the Catchments Project consultants in the development of the catchment discourse are discussed. Secondly, the terms of the catchment discourse (its policy vocabularies and story-lines) are explored, showing the linkages, and disjunctures, between this discourse and other municipal discourses. Thirdly, the formation of the discourse coalition around the catchment discourse and its associated story-lines is examined. The fourth aspect concerns the question of institutionalisation of the catchment discourse, and examines possible reasons why has this not occurred. The chapter concludes with a critique of the catchment discourse in terms of its alignment with the EM and strong sustainability discourses.

6.2 The role and influence of the project consultants

6.2.1 The consultants as experts

The consultants' role in the project originated in their involvement in the Environmental Services Management Plan (ESMP) project which was being completed as the Catchments Project began. They were chosen because of this background experience in the city's

environmental planning and management, and for the linkages between the catchment concepts of the ESMP and what the Urban Strategy Department (USD) was aiming to achieve through the Catchments Project. Although USD managed the project, together with input from the Spatial Theme Group members, the consultants played a dominant role in shaping and directing the project. This was evident from the project's inception – even the project terms of reference were drafted by one of the consultants (Respondent 15, Consultant, 2003). The project framework, concepts and indicators were developed by the consultants. USD and the Spatial Theme Group's main role was to provide feedback when the consultant's work was presented to them, and to provide data to feed into the environmental indicators. The consultant's project approach is reflected in these comments:

> "It was basically the consultants went away, did their work and then kind of presented after a few month's work" (Respondent 9, Transport, 2003);
> "They [the consultants] generated them and then we had to comment" (Respondent 1, Urban Strategy, 2003, referring to the development of indicators);
> "There was not very much debate with the project. It was basically very superficial" (ibid); and
> "I was involved in working out some indicators for the report with [another member of the consultant team]. Basically between the two of us we thrashed that out and then it went back to [Consultant A and B] for review and obviously to the client team as well. And then we were involved in just collecting all the information and basically drafting up the document" (Respondent 14, Consultant, 2003).

The relatively low level of involvement of municipal staff in the development of the Catchments Project was influenced to some extent by the limited project budget, time and capacity constraints, a lack of interest, and the technical nature of the project, as this comment suggests –

> "...to try and run workshops to get people's input at that level of detail wasn't easy ... I think there's also the understanding thing, the technical understanding is sometimes an issue ... and I think for a lot of the people that were involved in those workshops, that was not something they really wanted to get involved with, trying to understand all of that and see how everything fitted together" (Respondent 14, Consultant, 2003).

Nonetheless, it was the approach agreed upon by USD and the other municipal staff involved. The dominant role of the consultants certainly reflects a key aspect of EM - the expanding role of scientific experts in environmental policy making (Hajer, 1995). The municipal staff did not

question the consultant's approach because of their high level of credibility as experts in the field of environmental planning and management:

> "I don't remember getting involved in steering the course of the study or methodology or anything like that. It was more like they were the experts and this was their brief" (Respondent 9, Transport, 2003);
> "... the reputation of the consultants, you know – they are really good ... and so you just go with them" (Respondent 1, Urban Strategy, 2003); and
> "...the consultants were two or three steps ahead - they were pretty competent. They were given more or less free rein" (Respondent 4, Environmental Management, 2003).

Consequently, the consultants had a high degree of autonomy and freedom in running the project from their perspective as environmental management experts. This minimised the potential input of municipal actors who may have offered alternative viewpoints or approaches to how the project was conceptualised, developed and put into practice.

6.2.2 Consultants' terms of policy discourse

Apart from influencing the project approach, the consultants also influenced the project through their use of particular terms of policy discourse. Of interest is that the consultants also drew on the four municipal epistemic notions that encourage a strategic and integrated systems approach to environmental policy making, with a strong focus on factual data or information. In particular, the influence of ecological systems ideas was evident in their discourse. The most dominant policy vocabularies expressed by the consultants centred on the environmental management policy field, particularly D'MOSS concepts, as indicated in Table 6.1 below. Their use of planning vocabularies focused on land use management issues and processes.

Due to their specific educational backgrounds and work experience in environmental management and planning, the story-lines most commonly drawn upon by the consultants reflect a more limited perspective than that presented by the range of municipal story-lines covered in Chapter 5. The consultants focused on the environmental aspects of sustainability, reflecting EM and aligning strongly with the story-line promoting an environmental management approach to sustainability, as illustrated in this statement - "What we tried to do in this part of the report and in our initial thinking was to develop a sustainability management system" (Respondent 14, Consultant, 2003).

Table 6.1 Consultant policy vocabularies

CONSULTANT POLICY VOCABULARIES		
POLICY FIELD/AREA	POLICY VOCABULARIES	
	CONCEPTS/PRINCIPLES	TOOLS
Sustainability/Sustainable Development	Sustainability Sustainable development Triple bottom line Environmental sustainability	Sustainability Management System Sustainability Status Quo Local Agenda 21
Environmental Management	Ecosystem concepts - ecological processes, biodiversity, river systems Environmental impacts Cumulative impacts Quality of life, environmental health Resource economics concepts Win-win situation Less regulatory approach	Indicators Monitoring Environmental Management System Strategic Environmental Assessment State of Environment Report Environmental impact assessments, Scoping reports
Metropolitan Open Space System (sub-policy field of Environmental Management)	Open space, open space asset Open space planning D'MOSS Environmental asset, natural assets Environmental/ecosystem services Supply and demand of environmental services	
Spatial planning	Land use, land use management Urban design, landscape design	Spatial Development Framework Land Use Management System Plans, town planning schemes Planning procedures and processes Development control

However, they also drew on the broader sustainability story-line, relating to the integration of the three aspects of sustainability, for example –

> "It's like a company's bottom line ... it's the whole question of ecological sustainability, economic efficiency and social equity. That's the ABC of development, sustainable development" (Respondent 15, Consultant, 2003); and
>
> "... if we're to make our resources sustainable and the way that we live sustainable, one of the most important things that we've got to do is that we've got to think about ourselves individually, whether we are sustainable as individuals in our own right, whether we live in a sustainable way in terms of the way we manage our income and expenses, if we live in a sustainable way in terms of the way we manage our environment and our own homes, at the schools where our children go, or the places where we work" (Respondent 13, Consultant, 2003).

These statements illustrate that the consultants were clearly aware of the need to approach sustainability in a balanced manner, to ensure that social and economic aspects were given as much attention as biophysical aspects. Nonetheless, the consultants' project approach, which focused on the biophysical aspects, aligns with a more limited approach to sustainability.

Through their use of environmental management policy vocabularies, and as reflected in their ESMP and Catchments Project work, the consultants implicitly drew on all the environmental management story-lines. However, the story-line relating to environmental carrying capacity and limits is clearly reflected in these statements:

> "... we compared that map ... to the Spatial Development Framework ... to try and get a sense of what the SDF is saying about where development is going to go, relative to environmental scale and capacity" (Respondent 13, Consultant, 2003); and
> "... one of the key challenges we're facing ... is that the Ohlange catchment is stressed. We've just found out that the input of the wastewater into that estuary is degrading that estuary" (Respondent 3, Environmental Management, 2003).

Building on their ESMP work, the D'MOSS story-lines featured strongly as well, especially the environmental services story-line, for example:

> "... the role that open space plays, the fact that open space and the assets contained within there are actually delivering services..." (Respondent 13, Consultant, 2003); and
> "Basically the asset is there. All that you have to do is ... ensure that the service that it supplies continues to be supplied" (Respondent 15, Consultant, 2003).

Respondent 15 argued that the best way to ensure the continued provision of environmental services was not to continue buying up open space, but to involve the public in managing the services: "All you have to do is ... get people to buy in to the concept of managing, and providing various incentives and things like that would be the cheapest way of acquiring the service. Cause you don't want the land. All you want to do is get the services off it" (ibid). This comment links well with the municipal story-line promoting community participation in environmental management, and thus with the strong sustainability discourse. In the same vein, Respondent 15 argued further for the need to "get people aware of what ... the environment delivers, and get them organised around that ... start to talk to each other, understanding the

impacts of one user on another user and that kind of stuff. And we saw that as really the key option for environmental management in Durban, to start to do that and ...basically get residents and users involved in the whole process" (ibid). Of interest is how these statements align strongly with the strong sustainability discourse, yet were not influential in how the Catchments Project was conducted.

Lastly, the consultants mainly drew on the planning story-line that focused on the management of land use through development control procedures. This aligns with EM's focus on the management of environmental impacts, as shown in these statements:

> "So we tried to give the analysis that strategic thing, and then filter that into land use implications" (Respondent 13, Consultant, 2003); and
> "... the management of your environment is management of both those things – both the land use as well as the open space asset" (ibid).

However, Respondent 13, who is trained as a Town and Regional Planner, drew on the spatial planning story-lines as well, in relation to managing the environment:

> "And one of the things we began to develop was the whole notion of ... how do you understand open space planning in a spatial sense?" (Respondent 13, Consultant, 2003); and
> "What we are hoping to do is break that up even further by using ... district council boundaries ... to say that your district councils in the south, central and the north have got differing environmental issues" (ibid).

This brief review of the municipal terms of policy discourse drawn on by the consultants indicates overall a perspective which is focused on the biophysical environment and which relies on technical environmental management and land use planning tools and approaches. This managerial approach to the environment aligns well with the EM discourse. Nonetheless, Respondent 15's comments concerning the involvement of the local community in environmental management illustrate the influence of the strong sustainability discourse. Unfortunately, when it came to the Catchments project, the community participation story-line seemed to be submerged in the drive to gather technical biophysical data.

6.3 Catchment terms of policy discourse

Using the catchment as its key structuring element, the catchment discourse suggests certain ways of structuring environmental policy and practice in the municipality. The analysis of the catchment terms of policy discourse reveals the different elements of the catchment discourse which do this structuring work. This section first examines how the catchment discourse is strongly aligned with the same epistemic notions that influenced the municipal environmental discourse. It then explores the catchment policy vocabularies and story-lines which provide the key arguments for using catchments in environmental management and planning in the city.

6.3.1 Alignment with municipal epistemic notions

Embodied in the project report, "eThekwini Catchments 2002: A Strategic Tool for Planning", the catchment policy discourse reaffirms the power of the key epistemic notions which frame the discourse of the municipality and the project consultants. A strategic approach was one of the project's key principles. The report's title and section headings use 'strategic language' - "A Strategic Tool for Planning", "Strategic Catchment Assessment Process", and "Strategic Implications for Planning". Within the text of the report, catchments are defined as "strategic planning units", and it is argued that "(a)t a strategic level, catchments provide an indispensable mechanism for assessing the overall differences in environmental quality across the eThekwini area" (Diederichs et al., 2002: 2). Once the "strategic assessment of catchments" has been undertaken, the report outlines the different "levels and types of strategic planning responses" that should take place, at "a strategic area-based or a strategic sector-based level" (ibid: 3). Indicators were developed in this project as part of a strategic approach, as explained here: "... to be strategic, rather than rationally comprehensive, to be strategic an indicator tells you there's a problem with water quality. Therefore, there's something wrong, identify it and then try to work back from that" (Respondent 13, Consultant, 2003).

Integration was one of the key motivating factors for the Catchments project to be undertaken. The project terms of reference called for "a process for integrating catchments into spatial planning" (Urban Strategy Department, 2001). The Catchments report states that catchments "provide a mechanism for integrating the planning and investment of different sectors within a geographically defined area in a manner that is related to the environmental quality and sustainability of specific catchments" (Diederichs et al., 2002: 2). The Strategic Catchment Assessment Process was developed to enhance this integration in the municipality, and also demonstrates systematic characteristics, with its linkages between information gathering, assessment and implementation. Originally intended to provide a way of integrating strategic

planning and the environment with existing municipal processes and functions, ultimately the consultants could only develop a generic process due to the institutional changes and complexities at the time.

While not referred to directly in the Catchments report, a systems approach or systems thinking is reflected in the catchment discourse. Ecosystem concepts were drawn upon by the consultants in developing the concept of the catchment as an environmental management unit. Using terms such as "linkages", and "cause and effect", Respondent 13 (Consultant, 2003) in particular drew strongly on the principles of both a systems and an integrated approach when describing the catchment as a tool for "integrated development planning" –

> "Now from a point of view of the cause and effect, what happens upstream in terms of development has an eventual effect and will find its way all the way down through the catchment and will eventually find its way into the sea. ... So the links from a spatial point of view are able to be understood in a catchment sense. From a sectoral point of view, one can also understand that if you're doing something from a land use point of view, that has an impact on infrastructure, which has an impact on natural resources, which has an impact on a range of other kinds of social and economic sectors. So all of the sectors can be understood in an integrated way ... There may be some other forms ... to ... understand those linkages, but we've found that working from a kind of an environmental ecological system, the catchment has proved extremely useful".

Lastly, the catchment discourse ascribes a key role to up-to-date and accurate environmental information or data. The USD's motivation for the Catchments Project was largely based on the need for environmental information to guide planning:

> "[The Manager of the Urban Strategy Department] kept on asking for environmental information that could ... inform the city's strategic plan" (Respondent 15, Consultant, 2003);
> "it was an environmental information gap to be supplied on a spatial basis" (ibid); and
> "the critical question that kept coming up was, we want environmental information on a regular basis, but how do we actually integrate it into the planning process in Durban?" (Respondent 14, Consultant, 2003).

By drawing on the key municipal epistemic notions as discussed above, the catchment discourse reflects certain key elements of the EM discourse – an integrated approach to managing the

environment, the use of systems ideas and particularly a focus on quantitative data for environmental decision-making.

6.3.2 Catchment policy vocabularies

The catchment discourse's key concept is clearly the 'catchment', or 'river catchment'. The concept was never defined in any of the project documentation nor by the municipal staff or the consultants interviewed. However its usefulness as a concept is reflected in the different catchment story-lines, to be discussed in section 6.3.3. Related catchment concepts included 'sub-catchments', 'upper' and 'lower catchments' and 'cross-catchment transfer', as shown in Table 6.2 below.

Table 6.2 Catchment policy vocabularies

CATCHMENT DISCOURSE - POLICY VOCABULARIES	
CONCEPTS	**TOOLS**
Catchments, river catchments	Catchment tool, approach
Sub-catchments	Strategic Catchment Assessment Process
Upstream, downstream, upper/lower catchment	Catchment assessment, status quo analysis
Cross-catchment transfer, linkages, inter-catchment	Catchment Management Plans
Seepage catchments	Catchment Management Agencies, Catchment Forums
Catchment boundaries, areas	Catchment Management Branch
Catchment condition, state	Catchment co-ordinators, catchment management facilitators

The catchment concept is used in a range of environmental management tools or approaches. Specific to the project, these include 'the catchment tool', 'the Strategic Catchment Assessment Process', and the 'catchment status quo assessment'. More broadly, as reflected in the National Water Act (RSA, 1998d), catchment tools include catchment management institutions and plans, such as 'Catchment Management Agencies' and 'catchment management plans'. It is important to distinguish here between the catchment discourse of the municipality, and the broader 'catchment management discourse' embodied in the National Water Act and in national catchment management policy documents. The municipal catchment discourse draws from the catchment management discourse's story-lines, but also uses the catchment concept in a much broader manner to encapsulate all aspects of the natural, social and economic environment.

Other policy vocabularies of the catchment discourse draw from the sustainability, environmental management and planning policy fields. The Catchments report uses D'MOSS vocabularies, such as 'environmental services' and 'open space assets'. Also used are environmental and planning vocabularies such as: 'environmental sustainability', 'carrying capacity', 'sustainable limits', 'environmental quality', and 'land use management'. It is evident here that those municipal policy vocabularies drawn on in the catchment discourse reflect an EM approach to the environment, such as the use of carrying capacity and resource economics concepts.

6.3.3 Catchment story-lines

Hajer (1995: 62) describes story-lines as "narratives on social reality through which elements from many different domains are combined and that provide actors with a set of symbolic references that suggest a common understanding". In defining the key catchment story-lines it became evident that some of these story-lines are more broadly applicable to a range of actors than others. Due to their narrow focus, some story-lines do not in fact meet Hajer's condition of multi-interpretability. An alternative approach would be to draw together these story-lines into one catchment story-line with a range of different interpretations, to ensure that the story-line concept is correctly used. However, such an approach would not reflect the richness of the catchment discourse and its associated discourse coalition.

Therefore, at the risk of using Hajer's definition incorrectly, the catchment discourse is divided into six different story-lines, some of them being drawn on by a wider range of actors than others. The catchment story-lines are:

- The catchment is a useful tool to guide planning, land use and development in the city
- The capacity of catchments to accommodate development is limited
- The catchment is a useful spatial unit for city administration
- The catchment is the basis for stormwater management
- The catchment is the basis for integrated catchment management
- The catchment is an extension of D'MOSS

Besides describing these catchment story-lines and their relevance in the municipal context, this section also illustrates how they relate to the municipal epistemic notions and story-lines in various ways. The interaction between the overlapping catchment and municipal discourses and their associated story-lines is complex and multi-dimensional. This confirms the contentions of

Foucault (in Hajer, 1995, and Sharp, 1999) that multiple discursive elements interact in complex ways in the institutional context.

- **The catchment is a useful tool to guide planning, land use and development in the city** - This is the most dominant catchment story-line used by all the municipal staff and the consultants. The catchment is conceptualised as a land use management and planning tool using the information provided by the environmental status quo analysis in the Catchments report. It therefore aligns well with the municipal story-lines centred on environmental and planning tools and approaches, which reflect EM's management approach to the environmental problem. The 'catchment as a tool' is encapsulated in the approach of the consultants –

  "... we focused more on the technical approach, because we wanted to leave Urban Strategy with a tool that they could use, ok? But a tool that was telling them substantively this is what the condition of the catchments are, and this is what you need to actually do in terms of land use planning, in terms of environmental planning, in terms of urban structure planning ..." (Respondent 13, Consultant, 2003).

Corresponding with the epistemic notion that ascribes a key role to data in decision-making, the value of the 'catchment tool' is based on the environmental information that it provides, particularly for assessing development applications:

"I think it's a nice piece of information for planners because of the nature of the development application type work" (Respondent 1, Urban Strategy, 2003);
"... we certainly use it with specific development proposals...- 'How does the development sit in terms of that status quo analysis? What is the analysis telling us about what should and shouldn't be happening in the catchment?' And so we do use it like that" (Respondent 4, Environmental Management, 2003); and
"... we should be using this catchment tool as a uniform approach to assessing applications" (Respondent 6, Development Planning, 2003).

This 'catchment tool' story-line encapsulates a technical and managerial approach to the environment, as described here: "using catchment technology, catchment methodology begins to give you an understanding of where you can begin to be strategic" (Respondent 13, Consultant, 2003); and "in terms of developing a technical approach and this rationale

they used in terms of assessing the catchments ... I think they achieved that quite well" (Respondent 3, Environmental Management, 2003). The widespread use of this story-line reiterates the value municipal staff attribute to technical information and approaches reflective of EM.

- **The capacity of catchments to receive development is limited** – A key premise of the Catchments report is that "by strategically planning development within the limits of the environmental carrying capacity of each catchment, many of the social, economic and environmental impacts can be minimised" (Diederichs et al., 2002: 1). Environmental management interventions are needed because "the demands of human settlement have exceeded the capacity of the natural environment" (ibid). This catchment carrying capacity story-line therefore correlates with the municipal environmental limits story-line and the EM discourse. A limited number of municipal staff drew on this catchment story-line, using terminology such as 'stressed catchments' and 'development threshold', for example:

  > "that's what the Catchment study added to the work that we did. It showed where those opportunities and limitations actually existed in the natural resource base. It pointed to stressed catchments. It pointed to catchments that weren't so stressed. It gave a sense of the interplay of development and how it might now and in the future relate to that natural resource base and its long term sustainability" (Respondent 3, Environmental Management, 2003);
  >
  > "it could be worked out in fairly concrete terms what's the development threshold of a catchment" (Respondent 7, LUMS, 2003); and
  >
  > "they then looked at each catchment as to how pressurised it was from a development point of view, a contamination point of view, and therefore how much development could each catchment take" (Respondent 9, Transport, 2003).

Using this story-line, the consultants argued that carrying capacity varies between catchments. The results of the environmental status quo analysis in the Catchments report illustrates these variances, maintaining that development in the city is nearing or exceeding environmental limits in most of the centrally located catchments. As explained by Respondent 14 (Consultant, 2003), the report shows "those southern catchments, the ones where the density's lowest, coming out tops, and the ones where there's high development pressure under serious strain and already well beyond environmental sustainability limits". Density of development is therefore a key determinant of environmental impact – "...so

those areas in the south, even though the guys don't have services, the densities are low enough that the natural systems are still able to function" (ibid).

An important observation here is how the Catchments Report's contention that central catchments are stressed conflicts directly with the Municipality's promotion of densification in the core areas, as reflected in its SDF. Thus the catchment discourse (with its story-line of environmental limits) conflicts with the planning discourse (with its story-line of densification). This contradiction was only mentioned by two municipal staff, as demonstrated in the following statements:

> "[the Catchments report] is showing that in fact a lot of those catchments are under pressure and you can't develop them more. In fact, a catchment approach would say spread out your development more. We are saying consolidate onto a few [catchments]. ... So I think it's highlighted a fundamental problem between us" (Respondent 9, Transport, 2003); and

> "the concept that there is a line beyond which we can't take bulk infrastructure, just because of cost ... aligns itself with the political priority of reintegrating the apartheid city, that you want to bring development into the central areas. And if you look at where the catchments are most stressed, it's centrally. So you've suddenly got two big strategic ideas, one political, one economic, versus an environmental. ... I think the real problem is that it's highlighted the city under stress. It's highlighted conflict in strategic imperatives" (Respondent 3, Environmental Management, 2003).

It is interesting that this issue was detected by the Transport official, and not one of the city planners. However, densification is now a key principle in South African transport planning, to improve access to transport services, which may offer an explanation.

The inconsistencies between these two story-lines have not been discussed in any meaningful way by municipal staff. Respondent 3 (Environmental Management, 2003) argues that "(i)t's created a fluster but no one's responded to that in a strategic way. No one's picked it up and said 'well, we've got a real tension here. What do we do about it?'". This could illustrate the comparative strength of the densification story-line, embodied in the SDF, as opposed to the environmentally-based carrying capacity story-line. Thus the

identification of story-lines in discourse analysis can play a key role in identifying contradictions between the core principles of different city policies.

- **The catchment is a useful spatial unit for city administration** – This story-line originated in the Spatial Theme Group's deliberations around developing area-based planning and management units for the new municipal area. Drawing on the ESMP's catchment approach (eThekwini Municipality, 2001a), catchments were considered as one alternative to divide up the city on a spatial basis for administration purposes. As explained by Respondent 15 (Consultant, 2003):

> "... the city was deciding on the choice of management unit for the city. It was either going to be a political one, or a catchment-based one. That's where I managed to convince them, because they liked the concept of the catchment because it was apolitical, and it linked the poor people in the hinterland to rich people [lower] down. So that for them made a lot of sense".

While most members of the Spatial Theme Group supported this story-line, its implementation was overtaken by politics and the administrative demarcation of the city was put on hold. However, the story-line has maintained a certain power in the minds of those involved in the Spatial Theme Group. City planners in particular are still considering catchments as an organising unit for the city, although this time only for planning areas:

> "So, I'm going to make a very strong recommendation that we adopt these, or some variation, as boundaries for planning regions ... but I know it's not going to work as anything other than planning regions" (Respondent 7, LUMS, 2003); and
> "... it goes back to having planning regions and planning areas ... And once again, do we go a catchment planning route or don't we?" (Respondent 6, Development Planning, 2003).

This story-line links strongly with the spatial planning story-line relating to the delineation of areas for city management and planning, as well as the sustainability story-line focusing on the integration of economic, environmental and social aspects of development. One of the key reasons for using the catchment as a spatial administrative unit is its potential to integrate different municipal sectors, particularly those involving planning and the environment. This story-line is therefore reflected most strongly in the discourse of the city's

planning officials. The epistemic notion of integration is therefore also reflected strongly, as illustrated both in the Catchments report and in the comments of municipal staff:

> "Catchments provide a useful mechanism for integrating different development sectors within a defined geographic area" (Diederichs et al., 2002: 2);
> "the catchment could have been the foundation for tying all those things together" (Respondent 7, LUMS, 2003); and
> "it gives us not just a spatial unit, but also an environmental unit, a planning unit, and you can begin to look at a number of variables and use this ... to integrate" (Respondent 8, ABM, 2003).

As a city-wide management unit, however, the catchment is unlikely to be considered as a serious option, partly because of political reasons, but also because the needs of many municipal sectors do not align with catchments. As stated by the Municipal Manager (Respondent 12, 2003):

> "I think that was the problem for me of the 18 or 24 administrative areas approach ... because your administrative areas are never going to be administrative areas, because your Water can manage quite well with a single water system; Electricity they've got two power systems, or whatever; Works, in your Cleansing Services, maybe you want 25 little depots, stuck out across the city. So your geography across the city can vary across departments, and even within departments you'll find variation".

Although trained as a Town and Regional Planner, the above statement shows that the Municipal Manager perceives the city's administration requirements from a broader perspective than the needs of the city's planners.

- **The catchment is the basis of stormwater management** – The Drainage and Coastal Engineering Department uses catchments as its organising unit for carrying out its planning and maintenance functions related to stormwater control in the city. The catchment is the most appropriate unit for managing the flow of water. Due to the way land use and development impacts on the generation of stormwater, this story-line links well with the environmental management and land use management story-lines. It is reflected in a number of projects being undertaken by the Department, as described here:

> "We're currently spending out of Council money probably in the order of R1 million to R1.5 million a year just on the flood studies. ... These are all the catchments that we've already analysed" (Respondent 10, Drainage and Coastal, 2003); and
> "we've persuaded them to fund more detailed plans in two of the catchments" (ibid).

While it is mostly the Drainage and Coastal Engineering Department that draws on this story-line, other members of staff also relate to the stormwater aspect of catchments, as shown in this statement: "the whole catchment issue is [the Manager of Drainage and Coastal Engineering's] way of life. It needs to be the way he operates because he can't divorce upstream from what happens downstream" (Respondent 2, Urban Strategy, 2003). In terms of responding to development impacts, a key focus of the Catchments report is the management of stormwater, particularly to reduce the effects of flooding and erosion. The slides shown by the consultants at the final project presentation also focused on stormwater-related hazards and impacts. For example, the Catchments report states,

> "The impacts of development are most often generated and experienced within a river catchment. For example, the amount of sealed surface (i.e. development) in a river catchment affects the amount of stormwater that enters the river during rainfall events. The effects of increased flow in the river are experienced in the same catchment, e.g. properties and infrastructure near the coast may be flooded as a result of the high levels of development in the upper catchment" (Diederichs et al., 2002).

Using the water-based concept of the catchment as the key framing device for the environmental management approach does present certain limitations, however. Its applicability in terms of other environmental aspects, such as air quality, is unclear. It is even more difficult to apply to the social and economic aspects of sustainability, as social and development boundaries do not align with catchment boundaries. This story-line therefore has limited applicability to stormwater-related issues.

- **The catchment is the basic unit of catchment management** – Broader than just stormwater control, a catchment management approach relates to all aspects of water management using catchments as management units, in such a way that local users are involved in the management process. This catchment management story-line is drawn from the broader national discourse of catchment management as outlined in the National Water Act (1998). Linking to this story-line, the initiation of the Catchments Project was partly

based on the benefits of integrating with the local CMA initiative. Respondent 10 (Drainage and Coastal, 2003) explained how the Catchments report has contributed to how national government's catchment management approach is perceived –

> "up until ... this work [Catchments report] was done, I don't think there was very much sense of should we be looking at catchments. It's almost ... come together – the establishment of the CMAs and this work has sensitised people to realise that ja, there is something happening, and to try and dovetail into that".

Implicit in this story-line is a recognition of the value of the environment and the need to protect and manage the environment as reflected in the relevant environmental management story-lines. The catchment management story-line is also reflected in the Drainage and Coastal Engineering Department's current reorganisation along catchment lines to align with the local CMA:

> "So Catchment Management will be all the floodlines, pollution monitoring, preparing catchment management plans, co-ordination of catchment management, public education, preparing master drainage plans ..." (Respondent 10, Drainage and Coastal, 2003).

A key aspect of the catchment management story-line, as reflected in the National Water Act and the CMA approach, is the need for public participation in catchment management to ensure that broader social and economic issues affecting water use are considered. This links well with the municipal story-line related to community involvement in environmental management. Demonstrating strong sustainability principles, this aspect is incorporated into functions of the Drainage and Coastal Engineering Department's new organisational structure. The Department's catchment co-ordinators will be the "people on the ground, who are basically going to be able to go to the Catchment Forums ... to actually get along and represent the Council and get feedback on community [input]" (ibid).

A few other staff and one of the consultants also drew on this community participation aspect of the catchment management story-line, as follows:

> "from a catchment planning point of view you are getting communities to work together in that catchment, in terms of protecting the catchment, and the things that they do and the way they do it" (Respondent 6, Development Planning, 2003); and

> "get people aware of what catchments, basically the environment delivers, and get them organised around that, now start to talk to each other, understanding the impacts of one user on another user ... And we saw that as really the key option for environmental management in Durban, to start to do that, and basically get residents and users involved in the whole process" (Respondent 15, Consultant, 2003).

While this aspect of the catchment management story-line was evident in the discourse of some of the municipal staff and one consultant, it clearly did not impact on the Catchments Project approach and outcomes. The project drew only on municipal and other government sector information and inputs, and did not involve the local community. Hence this strong sustainability aspect of the story-line had little persuasive power in influencing the project approach.

- **The catchment is an extension of D'MOSS** – The Catchments Project built on the work done by the consultants in the ESMP, which conceptualised catchments as useful units for environmental management. This was confirmed in the following statements: "we were the building blocks for it because of our open space work" (Respondent 3, Environmental Management, 2003), and "the 2001 open space planning stuff that we did picked up on the catchment analysis or approach quite strongly" (Respondent 4, Environmental Management, 2003). In the Catchments Report, the use of ESMP resource economics concepts reflects its link with D'MOSS:

> "Environmental service assets and service levels vary between catchments, but they also vary between the lower, middle and upper reaches of the catchment"; and
> "the ability of the natural resource base to provide environmental services is already over-subscribed and needs to be augmented" (Diederichs et al., 2002: 7 and8).

Only the project consultants and Environmental Management and LUMS staff drew on this catchment story-line, predominantly making reference to the environmental services supplied by the catchments, for example:

> "the catchment has a supply, it has a demand. It has a supply of environmental resources which can deliver services and which can mitigate impact. That catchment also has demand driven by its land use, and at the end of the day that is what we are trying to balance" (Respondent 13, Consultant, 2003); and

> "there are direct linkages [with the Catchments Project] but they're hidden, in terms of environmental services and the value they provide to the city" (Respondent 7, LUMS, 2003).

By referring to the impacts of different land uses on the environmental services provided by catchment areas, the D'MOSS-catchment story-line reveals the relationship between land use and environmental services. Thus the municipal land use management story-lines overlap with this catchment story-line. This management approach to the environment and the use of the D'MOSS resource economics concepts in this story-line align well with EM.

6.3.4 Interaction between municipal and catchment story-lines

The analysis of the catchment discourse in the previous sections indicates that its story-lines are not confined to the Catchments Project. As illustrated in Figure 6.4 below, the catchment discourse consists of story-lines specifically attributable to the project as well as broader catchment story-lines which were already being drawn upon before the project began. The discourse has also changed over time as the project developed and other changes occurred in the municipality. The influence of other municipal discourses and their story-lines came into play to shape and define the current form of the catchment discourse.

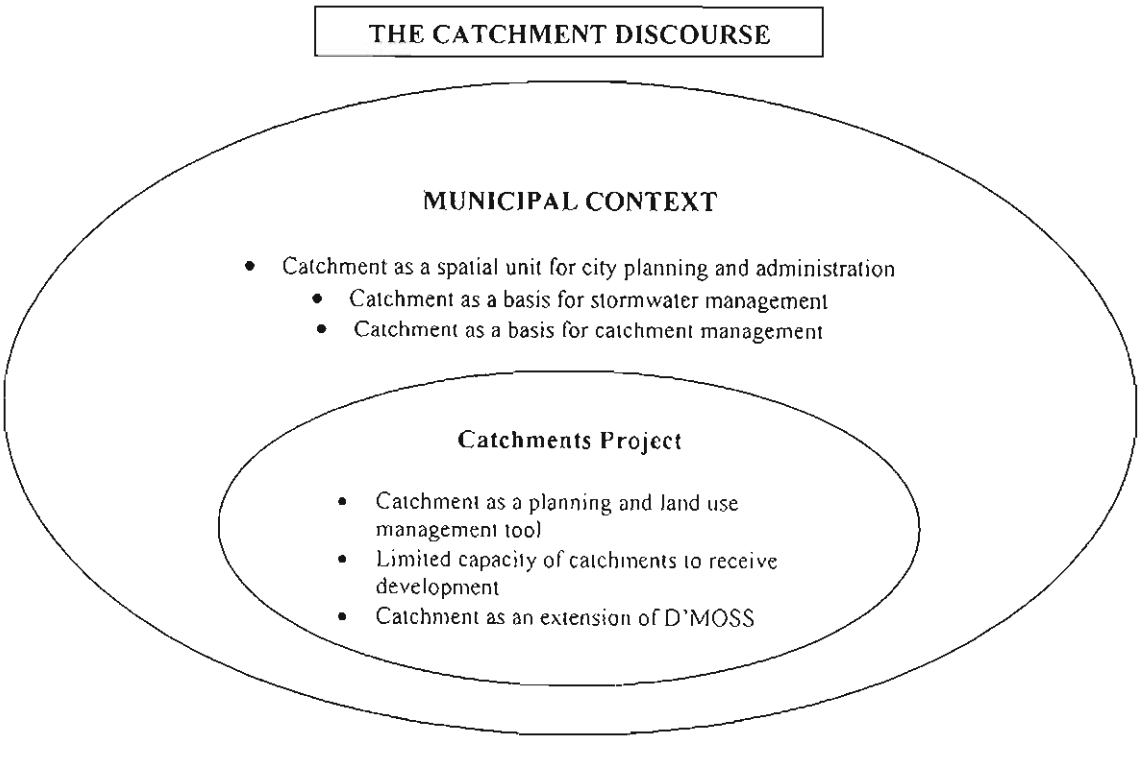

Figure 6.1 The catchment discourse and its story-lines

The matrix diagram overleaf (Table 6.3) provides a visual illustration of how the municipal and catchment story-lines overlap, or how the catchment story-lines have drawn from broader municipal story-lines. Only the explicit linkages between story-lines have been shown. There may be other implicit or weaker linkages between story-lines, but these have been excluded to focus on the main patterns of overlap. The key aspect of this interaction is that most of the catchment story-lines intersect with municipal story-lines focused on environmental and land use management. As a management tool for integrating environmental issues and planning, the Catchments report embodies this story-line interaction. Of interest is that the catchment story-lines only intersect in a limited way with the sustainability story-lines. While sustainability story-lines are well represented in the discourse of municipal staff and in municipal policy documents such as the IDP, the broader interpretations of sustainability were not particularly evident in the catchment discourse. Instead the focus of the catchment discourse is on environmental sustainability, and the use of sustainability and environmental management systems. This reflects an EM approach that emphasises biophysical aspects of sustainability and the use of a management approach to solve environmental problems.

Also of significance is the fact that the planning discourse's densification story-line does not overlap in any way with the catchment discourse, confirming the perceived inconsistencies between these two municipal discourses, as discussed earlier. This illustrates the conflict between EM's carrying capacity concept and the city's densification approach. However, densification does not necessarily conflict with EM as a whole, since EM contends that development and environmental management are not incompatible. Except for the catchment management story-line, the municipal story-lines reflecting social and economic development issues and community participation in environmental management are generally poorly reflected in the catchment discourse. The strong sustainability discourse therefore has limited influence on the catchment discourse. Overall, this matrix indicates that the catchment discourse is an environmental policy discourse focused on the biophysical environment and issues of environmental sustainability consistent with an EM approach. The role of human agency in bringing about discursive change is important here. For example, the Municipal Manager's strong focus on broader sustainability in the city may influence the catchment discourse. Catchment story-lines more strongly centred on social issues may evolve and be used more widely by municipal actors, indicating a move to stronger sustainability.

Table 6.3 The relationship between catchment and municipal story-lines

MUNICIPAL STORY-LINES		CATCHMENT STORY-LINES					
		C1	C2	C3	C4	C5	C6
Sustainability							
1	Integration of social, economic and environmental aspects						
2	Efficiency and improvement						
3	Environmental management systems and tools						
4	Economic growth from waste						
5	LA21						
6	The key to sustainability is institutional will						
7	Planning encompasses sustainability						
Environmental Management							
1	Environment needs protection and management						
2	Environment is the basis of development						
3	Must raise environment's profile						
4	Carrying capacity of environment is limited						
D'MOSS							
1	Open spaces are assets that need protection						
2	Open spaces provide valuable environmental services						
3	Catchments are useful units for managing open space system						
Spatial Planning							
1	The delineation of spatial areas or boundaries is useful for city management						
2	Densification of core areas to promote integration and efficient use of resources						
3	Use of land is a key municipal issue						
4	Appropriate development control measures to manage land use						
Community participation							
1	Community stakeholders need to be involved in environmental management						
Social and economic development							
1	Social and economic issues must be incorporated into environmental management						
Development costs							
1	Development must be balanced with other factors in a cost-effective way						

Catchment Story-Lines:

- C1: Catchment as a tool to guide planning, land use and development
- C2: The capacity of catchments to receive development is limited
- C3: Catchment as a spatial unit for city adminstration
- C4: Catchment as a basis for stormwater management
- C5: Catchment as a basis for catchment management
- C6: Catchment as an extension of D'MOSS

6.4 The catchment discourse coalition

Despite the overlap between municipal discourses, it is still possible to identify a catchment discourse coalition. As defined by Hajer (1995: 65), a discourse coalition is "an ensemble of (1) a set of story-lines; (2) the actors who utter these story-lines; and (3) the practices in which this discursive activity is based". The catchment discourse coalition therefore consists of the six catchment story-lines, the municipal actors who draw upon these story-lines in various ways – represented by the twelve municipal respondents interviewed – and municipal practices reflecting these catchment story-lines. These include the Catchments project and report, the Drainage and Coastal Engineering Department's reorganisation along catchment lines, and the deliberations of the Spatial Theme Group to use catchments to demarcate city administration regions. These practices are discussed in more detail in section 6.5 which looks at the institutionalisation of the catchment discourse.

Since only a small group of municipal actors were interviewed, the catchment discourse coalition is only a reflection of a broader coalition within the municipality. Interviewing a more extensive group of municipal actors could have revealed different story-lines and hence a different coalition, or even an alternate coalition opposed to the catchment discourse. Within this group of municipal staff, however, the catchment was viewed by all as a valuable concept, for a range of reasons as reflected in the different story-lines. During the project process, municipal staff readily supported the catchment concept, as illustrated in these statements –

> "I think everyone latched onto that catchment approach. There wasn't any conflict or dissension about that" (Respondent 7, LUMS, 2003); and
> "Well, the people there, certainly the planners in the city or the various components of the city, they were all very positive about it. Like guys in Wastewater, the Transport people, they were very much supportive and they were eager to get the document ... And all the planners to a tee ... realised the value of being proactive in planning. So they were quite keen to adopt this" (Respondent 15, Consultant, 2003).

This common support for the catchment discourse illustrates the power of the catchment concept in drawing together a range of municipal actors. The 'catchment' acts as a metaphor for a variety of catchment approaches, reflected in the story-lines. These different story-lines, or combinations of story-lines, were drawn on in a variety of ways by municipal staff depending on their responsibilities and perspectives. In fact, each municipal official did not draw on all

of the catchment story-lines, but drew on those which had particular relevance to them. Figure 6.2 below shows which story-lines were drawn on by some of the municipal officials.

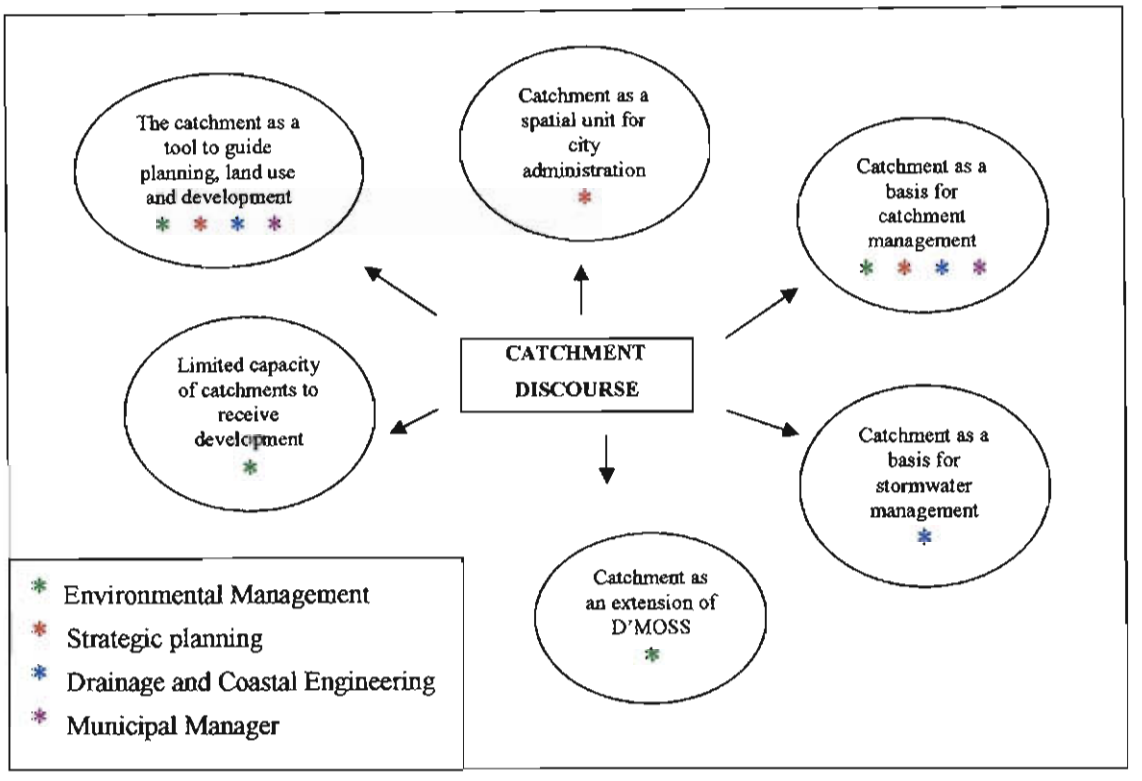

Figure 6.2 Municipal officials' use of catchment story-lines

Environmental Management Branch staff predominantly drew on the 'catchments as an extension of D'MOSS' story-line, due to the links between their ESMP work and the Catchments project. They also used the 'catchment as planning tool' and the 'catchment carrying capacity' story-lines reflecting a management approach to the environment, based on the perceived limits of the natural environment to accommodate development. Due to their support for the work being done by the Drainage and Coastal Engineering Department, they also draw on the 'catchment management' story-line.

Strategic planning staff (Urban Strategy and IDP) mainly drew on the 'catchment as a planning and administration unit' and 'catchment as planning tool' story-lines, focusing on the catchment as a means to aid strategic planning in the city. The 'catchment management' story-line was also drawn on, particularly by Respondent 1 (Urban Strategy), for its focus on involving the local community in environmental management through participatory approaches.

Respondent 10, representing the Drainage and Coastal Engineering Department, mainly used the 'catchment management' and 'stormwater management' story-lines, reflecting the day-to-day responsibilities and functions of the department. The 'catchment as planning tool' was also drawn on, in relation to the management of land use for stormwater control.

Of interest is that the Municipal Manager drew very little on the catchment story-lines, only using the 'catchment as planning tool' and 'catchment management' story-lines in a limited way. A catchments approach is not high on the municipal management's agenda (except as a sectoral function of the Drainage and Coastal Engineering Department) as indicated in this statement: "Let's not worry about whether catchment planning is the centre of the universe or not. If it's the best tool to address a particular problem because it will give you the easy measures of sustainability, then we'll use it for that" (Respondent 12, Municipal Manager, 2003).

The key characteristic of the catchment discourse coalition illustrated in Figure 6.2 is that, among the four groups of officials represented, the 'catchment as a planning tool' and the 'catchment management' story-lines were most dominant, drawn on by all the officials shown here. Each of the other four story-lines was only drawn on by one representative group. These four story-lines therefore have far less value in terms of multi-interpretability, as conceptualised by Hajer (1995). These are narrower story-lines, relevant for their applicability to specific municipal functions and responsibilities.

The catchment discourse's story-lines therefore enabled a range of municipal actors from different departments, with different responsibilities and perspectives, to find 'common ground'. Since each catchment story-line is associated in some way with other municipal discourses and policy fields, the catchment discourse coalition allows for the creation of communicative networks which combine actors from a range of policy fields. This adds to Bulkeley's (2000) point that actors draw on story-lines from a range of discourses and thus move between discourse coalitions. In fact, as illustrated by the catchment management story-line, some story-lines can underpin more than one discourse but in different ways.

6.5 Institutionalisation of the catchment discourse

The identification of catchment story-lines in the discourse of municipal staff illustrates that the catchment discourse is being drawn on by a range of municipal actors. The value of catchment concepts and approaches is recognised by municipal staff. However, the catchment discourse is

far from achieving either discourse structuration or institutionalisation at a municipality-wide level. This is illustrated by the outcome of the Spatial Theme Group's deliberations on using catchments as municipal administrative regions. While the use of catchments as city administration units was well-supported by the Spatial Theme Group and a number of key city directors, ultimately the approach did not have political support. Consequently the associated catchment story-line did not have sufficient credibility and acceptability (Hajer, 1995) to influence the municipal politicians.

Similarly, the three key story-lines associated with the Catchments Project have also not been sufficiently powerful to lead to the institutionalisation of this aspect of the catchment discourse in the municipality. The intention of the project was to use a catchment policy approach to influence environmental decision-making in the city, by feeding into key policy initiatives, such as the IDP and SDF, LUMS and ABM, while also assisting municipal staff in assessing development applications. As reflected in their use of the catchment story-lines, the municipal staff support a catchments approach and value the information provided by the Catchments report. However, in practice the Catchments report is only being used by a handful of staff (from Drainage and Coastal Engineering, Development Planning and Environmental Management) for catchment management and the assessment of proposed developments. However, even then it is used in a limited way.

Most municipal staff have not incorporated the findings of the Catchments report into their work. It has not influenced strategic municipal initiatives such as the IDP, SDF and Area-Based Management. The limited influence of the discourse is reflected in the following statements:

> "from the IDP side, the team is acknowledging it [the Catchments report], ... but kind of hoping that it gets picked up" (Respondent 5, IDP, 2003);
> "I don't hear it [the Catchments report] being mentioned ... in the same breath as, 'we've received an application for this and we've looked at the Catchment ...'. It doesn't happen" (Respondent 7, LUMS, 2003);
> "I haven't worked through the entire document myself" (Respondent 6, Transport, 2003);
> "I'll be honest – we haven't considered it. What I'm saying is, if we found this piece of land, we wouldn't pick up this document and say this catchment is under quite a bit of pressure, so maybe we shouldn't [develop]" (Respondent 11, Housing, 2003); and
> "What I'm seeing is that the guys aren't using it, and ... it's tricky to know exactly why they're not using it" (Respondent 14, Consultant, 2003).

It is only within the Drainage and Coastal Engineering Department (DCED) that the influence of the catchment discourse can be observed. DCED has initiated a new organisational structure, and a number of institutional actions and practices based on catchments. The catchment management story-line is the most influential story-line here, reflecting the catchment management discourse promoted in the National Water Act and the policy of the Department of Water Affairs and Forestry. While this could be an indication of institutionalisation of the municipal catchment discourse, it is more likely that these institutional changes reflect the structuration and institutionalisation of the national government's catchment management discourse in the municipality. The catchment management discourse concentrates on the management of water resources - the mandate and focus of DCED. In contrast, the municipal catchment discourse is a broader environmental discourse aimed at integrating planning, development and the environment in the city. Hence the institutional practices in DCED more closely reflect the national catchment management discourse.

The lack of institutional support for catchment-based administrative areas, and the limited use of the Catchments report by municipal officials indicate that the catchment discourse remains predominantly at the level of discourse. It has not filtered down to a level where it impacts and changes institutional practices in the city. What then are the dynamics at play that have affected the lack of institutional support for the catchment discourse? Commenting specifically on the Catchments Project, the consultants and the municipal staff attribute its limited influence to a number of factors:

- The institutional transformation of the municipality has played a key role in drawing the attention of municipal staff away from their work. Their involvement in the Catchments Project and the consequent implementation of the catchment approach into their work was therefore limited, as illustrated here: "I don't think they [city planners] had opportunity to actually focus on it and try and implement it. I think maybe because they are absorbed in the restructuring of Council taking place" (Respondent 6, Development Planning, 2003).

- A related factor is the lack of staff capacity to take on a new approach to their work, as argued by Respondent 11 (Housing, 2003): "we're always under-resourced, under capacity, and to dedicate a lot of time to a project may be quite demanding for officials not directly involved with the environment".

- Some staff argued that the Catchments project needs an institutional home or its implementation to be effective. Although the project was initiated and managed by the Urban Strategy Department, it is not necessarily the most appropriate base for the report, because "they work at a strategic level. From that level it's hard to drive something down to implementation" (Respondent 7, LUMS, 2003). Due to its strong biophysical focus, others argued that it should be based with the Environmental Management Branch. A related issue is that the generic Strategic Catchment Assessment Process needs to be based in a municipal department, for the ongoing assessment and monitoring of catchments to be practically implemented.

- To enable city-wide implementation, the report needs to receive the political support of Council. The project has never been presented to Council and consequently its implementation has not been taken up by municipal management. If a report is approved as municipal policy, it has much more political weight and authority in decision-making, as stated here:

  > "... another reason for its not receiving its full potential as a report in terms of information being used constructively in the city would be that the report has never been taken to Council. ... We don't simply have a report and then try and sell it to other line functions. We take it through Council and Council approval. ... And so, we don't only then work within the mandate of national and provincial environmental law. We also work within the local government policy decision" (Respondent 4, Environmental Management, 2003).

- The Catchments report also requires integration into strategic municipal initiatives, such as the IDP, SDF, LUMS and ABM to be effective at a municipal level. Council support of the report would enable this to happen. Integration with such municipal initiatives will be effective because they have high exposure, as argued here – "that's mainstreamed already ... everybody knows the SDF and IDP. It's right up there in the political world with all the top officials. You don't have to sell it too hard" (ibid).

- Linked to the need for an institutional home, is the need for a champion for the Catchments report, to ensure that the report gets promoted at all levels of the municipality and beyond. Apart from one presentation of the report to municipal staff and provincial government

departments, no efforts have been made to promote the project since it was finalised, as reflected in these comments:

> "I think what it has lacked is a champion. ... [the project] got done but it's lacked a champion in terms of ensuring it gets the correct profile and it's integrated into the various line functions planning and thinking" (Respondent 4, Environmental Management, 2003).
> "... not sufficient, or aggressive enough follow-up" (Respondent 5, IDP, 2003);
> "Even if it's there institutionally, how do you excite people, make people interested about it?" (Respondent 5, IDP, 2003);
> "So that's part of the championing stuff. It's about going and doing some presentations to Agriculture and Environment Affairs. It's about going and doing a presentation to Council. ... Its about getting [the Head of Drainage and Coastal Engineering Department] to start changing engineering standards in the Red Book" (Respondent 2, Urban Strategy, 2003); and
> "I think it's also got to be sold to the officials. ... as much as I've said there wasn't any opposition or anything like that, they've still got to integrate it into what they do" (Respondent 13, Consultant, 2003).

- A key aspect lacking in the project was the implementation of staff training once the project was finished, as explained here:

> "One thing was that was lacking, was that 'Alright, now you've done this, how do we use it?'. It's the thing that wasn't workshopped. How do we implement it? How do we use it in our day-to-day work? Was there a need for training workshops, or trained staff?" (Respondent 6, Development Planning, 2003); and
> "... we were expecting [the Manager of the Urban Strategy Department] to ... set up a system of showing people how they can use it. And than was never pursued" (Respondent 15, Consultant, 2003).

- The fact that the city is not institutionally organised on a catchment basis was also believed to restrict the implementation of the Catchments Project, as argued here:

> "The difficulty is that structures are not institutionalised on a catchment basis, and that's a big problem, because it just makes it very difficult to try and put into practice" (Respondent 2, Urban Strategy, 2003).

- Respondent 5 (IDP, 2003) argued that the Catchments report could be perceived by some as being too focused on biophysical aspects, and therefore not relevant to their line of work -

> "... in terms of a mindset from the development practitioners that 'Well, that's just another green report'. But if [the Catchments report] was packaged as maybe phase one, phase two, phase three, or running concurrently, that you come up with something that people are going to take seriously. ... Because often just the simple thing of phasing – 'let's start with this and then see what happens' – gets painted ... green".

The Urban Strategy Department's management of the Catchments Project, particularly since it was finalised, has not facilitated the structuration and institutionalisation of the catchment discourse in the eThekwini Municipality. However, the catchment ideas and principles contained in the catchment story-lines are still valued by the municipal staff interviewed. Although, these are expressed most strongly in practice by the Drainage and Coastal Engineering Department, the opportunity still exists for other sectors to build on the catchment management approach. For example, Development Planning staff have indicated their intention to consider structuring their planning regions on a catchment basis.

6.6 Implications for sustainability

As with the majority of the municipal discourses discussed in Chapter 5, the catchment discourse predominantly aligns itself with the EM discourse. Using the Catchments Project report and approach as its main reference point, this final section of the chapter illustrates the EM characteristics of the catchment discourse, while also reflecting on the few elements hinting at a move towards strong sustainability.

The catchment discourse is primarily concerned with the management of impacts on the environment, through a range of management approaches, including stormwater management, catchment management, land use management, city management and environmental management. This coincides with the EM discourse which perceives the environmental problem as a management problem (Hajer, 1995). The Catchments Project report as a tool for environmental and land use management therefore offers a management solution to the environmental problems of the eThekwini municipal area.

As an embodiment of the catchment discourse, the Catchments report assigns a central role to technical data relating to the biophysical environment. One of the main reasons for the initiation of the Catchments Project was to obtain environmental data to guide planning in the city. The consultants' use of biophysical indicators to measure the environmental quality and health of the city's catchments, and their focus on quantitative data reflects this technical focus. According to Respondent 1 (Urban Strategy, 2003), the Catchments report was

> "conceptualised in such a way where it would provide a data set that is very technical, technocratic in a way. So it's something that you can take, put on your desk, look at the physical aspects of your project, and then look at the data that is provided for the catchment, and then try to make a decision that way".

The 'catchment as a decision-making tool' story-line encapsulates this technical approach. Environmental decision-making is encouraged to rely on factual quantitative data on the biophysical environment, reflecting the instrumentalist rationality of EM.

A related feature of the catchment discourse is its focus on the biophysical environment. Except for elements in the catchment management and 'catchment as a spatial administration unit' story-lines, that focus on a more balanced approach to sustainability, the catchment story-lines were focused on the natural environment. The Catchments report states that "(a) strategic catchment assessment should undertake to evaluate the social, economic and environmental situation in the catchment. This study, however has focused on ... the environmental status of catchments" (Diederichs et al., 2002: 4). According to Respondent 1 (Urban Strategy, 2003), putting the biophysical environment at the centre is the typical approach of the Environmental Management Branch – "there's always this urge to get data sets, to get technical and environmental information of the biophysical environment, to use that as a base and an underlayer of most of the positions of the various sectors".

The Urban Strategy Department intended to extend the Catchments Project to incorporate social and economic indicators. However, two years since the completion of the project, this has not happened. As argued by Respondent 5 (IDP, 2003), "Isn't there in a sense a missed opportunity in that we say, we talk about sustainability in its broadest sense, but when we have phase one, which is looking at biophysical, ... sometimes we fail to pick up, because there's not aggressive enough marketing to pick up the other two issues". Thus although social and economic issues and factors are recognised, the catchment discourse does not give them equal attention. The strong sustainability discourse is therefore sidelined in the catchment discourse.

The strong role of the consultants as 'scientific experts' also reflects the EM discourse. Because of their credibility as experts in the fields of environmental science and environmental management, the staff generally allowed the consultants to control the project process. Using resource economics, systems ecology and carrying capacity concepts, this EM approach to sustainability influenced how the project was shaped. As the municipal staff had limited involvement in the development of the indicators, except for providing the base information and providing comments during the process, the consultants controlled how this data was interpreted. With no involvement from a wider spectrum of the municipal staff (for example, Health) or from the wider community, the results of the report are therefore generally the consultant's interpretation of the information.

In addition to the somewhat limited role played by municipal staff in the development of the Catchments project, it was also shaped to exclude public input. The lack of public participation in the project was explained by Respondent 1 (Urban Strategy, 2003), "Certainly it was a consideration in this project ... we've got to have the word participation, so we'll make it stakeholder participation, but we'll keep it professional, within the sectors". The financial costs of extending this project to include the wider community were probably a major consideration. However, in terms of adhering to the municipality's legislative responsibilities to civil society, Respondent 1 (ibid) questioned this approach: "is there room ...where we just develop something purely for professional use?". Due to this approach, the responsibility for the management of the environment is municipality-based - it does not give space for "how other role-players can add to the management and monitoring" (Respondent 1, Urban Strategy, 2003). Essentially, the voice of the community was excluded from the development of this policy document. Wider consultation may have resulted in different (and possibly more appropriate) indicators being developed, the responsibility for environmental management and monitoring being spread to the community, as well as ensuring that a broader sustainability assessment was undertaken. This would have ensured a space for strong sustainability concerns and issues to be raised, which would have shaped the Catchments Project in more socially sensitive way.

Overall, the Catchments Project epitomises an EM approach to the 'environmental problem' in the eThekwini municipal area. It focuses on techno-managerial solutions based on biophysical information to guide environmental decision-making. It neglected to incorporate the participation of the local community, which could have led to the consideration of associated social-economic and power issues. It therefore excludes the perspectives of a range of community role-players who make use of and impact on the city's environment. The

municipality is perceived as the chief player responsible for environmental management in the city. The potential role of the local community in city environmental management is therefore excluded.

It must be pointed out, however, that certain aspects of the catchment discourse do show some signs of moving towards strong sustainability. The catchment management and 'catchment as spatial administration unit' story-lines offer a more balanced consideration of social, economic and biophysical aspects related to environment and development in the city. The participation and empowerment of the local community is an important part of the catchment management approach, which seeks to involve the community in the management of water-related aspects of the environment. While these story-lines are not well-reflected in the Catchments Project, the fact that they are reflected in the discourse of municipal officials perhaps indicates that in time these ideas will become more entrenched in the municipality. If so, the catchment discourse as a whole may evolve to reflect more clearly the strong sustainability discourse.

6.7 Conclusion

This analysis of the catchment discourse provides useful insights into the way discourses operate in an institutional context. Of particular interest is the interdependent nature of discourse dynamics, through the overlap and interaction between a range of story-lines in the broader environmental policy arena. The catchment case study has shown that the deliberate introduction of new policy approaches, such as the eThekwini Catchments project, cannot rely solely on the power of discourse to translate rhetoric into practice. Associated discourse institutionalisation requires the active agency of institutional actors. These issues are discussed in more depth in the final chapter.

The eThekwini Catchments case study has also shown that, despite being clearly reflected in national policy and legislation, the strong sustainability discourse has limited representation in the environmental discourse and practice of the eThekwini Municipality. An EM approach to the environment dominates environmental policy and decision-making. Certain officials, however, do draw on aspects of strong sustainability. The catchment management approach of the Drainage and Coastal Engineering Department certainly holds promise for ensuring that social issues and concerns are integrated into the management of the city's water resources. The final chapter considers how this approach could be extended more broadly in the city through the use of more interactive and deliberate environmental policy making.

CHAPTER SEVEN: CONCLUSION

7.1 Introduction

Environmental policy making in local government is complex and multi-layered. This research has attempted to unravel some of these complexities by using a discourse approach. The first section of this concluding chapter considers how Hajer's discourse concepts and methodology facilitated an understanding of the discourse dynamics influencing environmental policy making. In particular, his concepts revealed the dependencies and discontinuities between discourses, and the important role of human agency in discourse institutionalisation. The use of the eThekwini Catchments case study revealed that new environmental policy in the municipality is strongly influenced by the EM discourse. Consequently, the second section of this chapter considers an alternate catchment approach, 'the communicative catchment', which reflects a strong sustainability approach to environmental policy making in the municipal context.

7.2 The application of discourse theory in empirical research

Hajer's approach to discourse analysis has proved to be a useful means of uncovering discourse dynamics in environmental policy making in the eThekwini Municipality. While this theoretical approach is of European origin, this research has shown that it can be applied equally well to institutional contexts in the developing world. Hajer's discourse concepts - the story-line, discourse coalitions, epistemic notions and policy vocabularies – were practical and appropriate tools for undertaking empirical discourse research in South Africa. The concept of epistemic notions was particularly useful, as it revealed the power and pervasiveness of these structuring ideas on a range of policy fields and discourses in the eThekwini Municipality. Since the EM discourse was well aligned with these epistemic notions, it was able to exert considerable power in structuring environmental discourse in the municipality.

Through discourse analysis, the identification of story-lines revealed the key framing arguments influencing the municipality's approach to the relationship between the environment and development. These story-lines indicate the accepted ways of talking about 'the environmental problem', which overall reflect a techno-managerial approach to sustainability focused on the biophysical environment. As argued by Hajer (1995), story-lines draw attention away from the contextual or social understandings of a problem. Thus in this case, issues of community

representation, social justice and power are excluded by the 'problem closure' achieved through adherence to the city's dominant story-lines. In the case of the catchment discourse, this was partly achieved through the dominant role of the consultants as scientific experts, and the project approach which excluded the contributions of a wider range of municipal role-players and the local community.

While Hajer's framework for discourse analysis (2003) was intended for the study of a single policy discourse, this research has shown that it can also be applied to understanding the interaction of multiple discourses in an institutional context. Of special interest is how the analysis revealed the overlap and linkages between municipal story-lines, and hence municipal discourses, confirming Foucault's claims regarding the 'play of dependencies between discourses' (Hajer, 1995: 47). Some story-lines employ the same or associated concepts which draw these story-lines together. For example, the municipal sustainability story-line that speaks of efficiency and improvement in the use of municipal resources aligns strongly with the planning story-line promoting densification, since it focuses on the efficient use of the city's land and services infrastructure. Story-lines can therefore support each other, and in so doing, strengthen the key concepts or principles which they share. This suggests that the influence of any discourse in the institutional context can be affected by the degree to which it draws from other discourses, or supports other discourses in various ways. Sharp (1999: 150) speaks of this as the formation of "discourse alliances" – an alliance develops when "different discourses work together to their mutual benefit". This does not necessarily result from any conscious actions of the municipality to align policy goals, but naturally occurs when different issues or debates, often with different agendas in mind, coincide around specific aspects. Thus the social imperatives of the densification story-line to create an integrated post-apartheid city, coincide in this case with the municipality's sustainability orientated-goal to develop the city in a cost-effective and efficient manner.

This discourse analysis also revealed what Hajer (1995: 47, following Foucault) refers to as 'the discontinuities' between discourses. In the municipal context, due to the large volume of discourses being produced and reproduced, the potential for contradictory or inconsistent discourses is high (Sharp, 1999). This was illustrated by the discontinuities or contradictions between the catchment discourse and the planning discourse. The planning discourse promotes the densification of the core areas of the city, while the catchment discourse argues that the core areas have already reached environmental sustainability limits. Currently the planning discourse's densification story-line exerts considerable power in the city, as it is a key framing

device of the SDF and has the support of the Municipal Council. Thus the environmental limits element of the catchment discourse is unlikely to hold much sway in the municipality for some time to come.

Thus far, the analysis has been concerned with the structuring power of discourses and their story-lines, and the interaction between discourses, with little attention given to the role of human agency. This is partly due to the fact that this research was based on interviews with individual municipal role-players, and only after the Catchments Project was completed. A review of project presentations and Spatial Theme Group discussions during the project period may have produced text that more clearly illustrated the argumentative nature of discourse interaction. The various discourses and story-lines uttered by municipal officials in relation to one another would have revealed the process of argumentation, i.e. how actors try to persuade others and how they position one another in different ways through discourse (Hajer, 1995, 2002). However, this research has still indicated that by drawing on different story-lines, which in themselves are specific arguments, municipal actors reveal their respective argumentative positions relative to one another. An associated issue is that, unlike similar research in environmental policy making (for example, Hajer (1993, 1995), Healey (1999), Keeley and Scoones (2000) and Ginger (2000)), this research was not able to observe changes in discourse over a period of time. It has only been able to reflect the nature of municipal discourse during a narrow 'slice-in-time'. The analysis of discourse produced over a longer time period could have illustrated the competing and dynamic nature of discourse interaction in the municipality, which would have been useful to illustrate how the catchment discourse has developed and changed.

Nonetheless, this research does demonstrate the importance of human agency in the production and reproduction of discourses. In the municipality, policy discourses originate in different policy fields through the appropriation and expression of certain ideas by individual municipal officials. As illustrated by the catchment discourse, new discourses are shaped by a range of existing discourses – municipal and national, or related to specific academic fields such as planning or environmental management. However, these discourses do not act on the new discourse independently of human agency. It is the act of human agency (that selects certain ideas and discards others) that determines the nature of the new discourse. In the case of the Catchments Project, the consultants played a key role as scientific experts in shaping the catchment discourse. The key municipal story-lines used by the consultants resulted in the dominance of one particular story-line – 'the catchment as a planning and land use management tool' – which was accepted and reproduced by all the municipal officials interviewed.

Consequently, human agency plays an important role in the production of new municipal discourses.

If human agency plays an important role in the development of discourse, it is also influences discourse institutionalisation. This has particular relevance for deliberate policy-making. Discourse institutionalisation is achieved as much by the power of the discourse itself, as by the deliberate and conscious efforts of municipal officials to ensure that a particular policy is used as intended and therefore influences decision-making (Healey, 1999). As discussed in Chapter 6, the fact that the catchment discourse has not achieved discourse institutionalisation can be attributed directly to inadequate interventions by the responsible municipal officials. A number of deliberate actions to 'champion' the Catchments Report, such as the submission of the report to Council, the training of relevant municipal officials and the integration of the report's findings into city initiatives, could have furthered the institutionalisation of the catchment discourse.

In comparison, a stronger municipal discourse, the D'MOSS discourse, has been institutionalised by the concerted efforts of the Environmental Management Branch. The D'MOSS policy is constantly promoted, as described here by Respondent 4 (Environmental Management):

> "Compared to our D'MOSS work it's different, in the sense that every single day we use the word, we refer to it in letters, in presentations, in consultation with councillors, and mostly in a regulatory fashion. I mean in other words, 'you can't do it because it's MOSS and these are the reasons why it's MOSS'".

Over the years, the evolving D'MOSS approach, including the current ESMP, has been submitted to Council for its support and approval. Consequently, the D'MOSS discourse has the necessary political support, an act of human agency, to be implemented and applied in environmental decision-making. Another example is the efforts of the new Municipal Manager to instil a sustainability perspective in all municipal responsibilities and activities. At a municipality-wide level, the sustainability discourse is still a relatively new discourse, best reflected in the IDP. To encourage municipal councillors and officials to appropriate and implement the sustainability discourse, the Municipal Manager is deliberately 'selling' sustainability, as explained in this discussion:

> Municipal Manager: "Now, as I say, I've got probably about another 18 months, my belief is, here to get us all developing that [sustainability] language, thinking that philosophy, thinking through those issues, but it's not going to be less than that".
> Researcher: "So, how do you intend to do that? Just by talking your way through?"
> Municipal Manager: "Engagement, thinking, changing ideas".
> Researcher: "Ja, so the whole persuasive, not persuasive in a rhetorical way...?"
> Municipal Manager: "Well, it's persuasive and Mike Sutcliffe style, you know. You just shoot from the hip ... cowboy".
> Researcher: "Tell them, ok".
> Municipal Manager: "How else do you do it?"
> Researcher: "No, well, that's the thing - you've got to use words. There's no other way to do it".
> Municipal Manager: "It's words, it's forcing people to think ... A bit of persuasion, a bit of hammering, a bit of, I mean it's partly discourse, but I'm not overly worried about that because people will theorise in their own way, but let's build ... a much better sense of where sustainability's in the system".

The deliberate actions of the Municipal Manager to encourage a sustainable mindset in the municipality confirm Hajer (1995) and Sharp's (1999) arguments that human agency plays a critical role in the production and institutionalisation of discourse.

By demonstrating the empirical outworkings of discourse in the eThekwini municipal context, this research both supports and contributes to discourse theory. The use of Hajer's concepts and discourse analysis methodology illustrates in a practical way how discourse is produced, reproduced and institutionalised. It reveals the complexity of discursive activity, the dependencies and discontinuities between discourses, and the constantly evolving nature of discourses. The key role of human agency in the production and institutionalisation of discourse is also demonstrated. This has implications for deliberate policy making, which is explored from a different angle in the next section. Here an alternative catchment approach is suggested, which aims for stronger sustainability in the municipal context.

7.3 An alternative catchment approach

As illustrated through discourse analysis, the Catchments Project and its associated report represents an EM approach to environmental policy making, thus promoting a weak form of sustainability. The project concentrated on environmental sustainability, thus neglecting social

and economic sustainability aspects, and excluded the local community and other relevant role-players in its development. Nonetheless, the catchment discourse does reflect some strong sustainability characteristics. An important element of the catchment management story-line is a recognition of the need to involve the local community in catchment management efforts. This story-line is being institutionalised through the Drainage and Coastal Engineering Department's new structure, which includes the appointment of catchment management co-ordinators to facilitate communication with the local community. While these changes indicate a move towards more sustainable catchment management, the city's catchment approach is limited by its focus on water resources. It is therefore not structured in such a way to achieve broad sustainability in the municipal area.

A broader catchment approach that incorporates strong sustainability aspects is Integrated Catchment Management (ICM). In an ICM approach "the catchment serves as the territorial unit for achieving the integrated management of all environmental resources" and "involves stakeholders in a self-regulatory process" (Görgens et al., 1998: 6). In its widest sense, ICM "recognises the need to integrate all environmental, economic and social issues within a river basin ... into an overall management philosophy, process and plan" (Department of Water Affairs and Forestry, 1996). Thus ICM expands the current catchment management approach of the National Water Act (RSA, 1998d) beyond its focus on water resources to all environmental resources, and can even include the integration of social, biophysical and economic issues. In addition it includes the involvement of relevant stakeholders, offering considerable promise in aiming for strong sustainability.

Due to its inclusiveness, ICM is regarded in water management circles as the ideal approach for managing South Africa's water resources (Görgens et al., 1998). However, implementation is still in its infancy, partly due to the current approach of the National Water Act (RSA, 1998d) which is limited to water resources management. In addition, the difficulties of aligning the different responsibilities of government departments and municipal authorities and the fact that the Department of Water Affairs and Forestry has little control over land use activities, mitigates against implementing an ICM approach at this stage (Görgens et al., 1998).

Despite these limitations at national and local level, the municipal level of government could still provide a suitable institutional base for implementing an ICM type approach aimed toward achieving broad sustainability. The wide-ranging responsibilities of municipalities, especially related to land use and development, could act as a platform for biophysical, social and

economic integration. This could offer the eThekwini Municipality an opportunity to move beyond the techno-managerial approach of the Catchments Project, by using the catchment as a base for the socially inclusive management of the city's environment. For political reasons, it is unlikely that the city will be delineated on a catchment basis for administrative purposes. Nevertheless, certain of the city's planners have indicated that the catchment could be used as the basis of planning regions which are yet to be defined. Since it has been argued that "planning is about sustainability" (Respondent 2, Urban Strategy, 2003), the catchment as a planning region could provide a base for integrating the environmental, social and economic aspects of sustainability.

If such an approach is to aim towards strong sustainability, more than just social, economic and environmental integration is required. The essential element would be to facilitate appropriate institutional arrangements to ensure that the local community is intrinsically involved in the management of the city's environment. Such an approach should provide for a new kind of environmental policy making, based on collaboration and shared decision-making, suggestive of Hajer's reflexive ecological modernisation. As outlined in Chapter 2, the value of deliberate democratic practices in environmental policy making is their focus on encouraging the expression of perspectives independent of those of scientific and professional experts. This provides scope for issues of social justice, equity and power to receive attention. Ultimately, such communicative action aims to achieve shared understandings about problems and possible solutions. Deliberative policy making approaches have been attempted in catchment management initiatives world-wide, but particularly in Australia and the United States (Martin, 1991; Bentrup, 2001; Reeve, 1999; McGinnis et al., 1999; Rhoads et al., 1999). These experiences provide a useful guide for implementing a deliberate catchment-based approach in the eThekwini Municipality.

Based on action research in agricultural catchment management in New South Wales, Australia, Martin (1991) presents a vision of the "communicative catchment". Drawing from Habermas (1981) and Beck (1983, 1988), this approach integrates the principles of sustainability, participatory democracy and community empowerment. A more complex and people-orientated approach to catchment management than other approaches, the communicative catchment concept "incorporates community in the management of the catchment as participants. Resource managers have a role as action researchers, facilitating and coordinating community involvement and action" (Martin, 1991: 777). This strategic integrated approach emphasises effective communication, community responsibility and participation. The role of government is

not to identify problems, but to facilitate problem identification and strategies for improvement. Government therefore moves "beyond the role of being planners, experts, and decision makers to a facilitative and educative role supporting community participation" (ibid).

Martin (1991) contrasts the communicative catchment with more traditional catchment management approaches – the reduced catchment, the mechanical catchment and the complex catchment. The reduced catchment approach reduces the catchment to separate parts, such as water and soil, and emphasises cause and effect relationships. This approach is based on positivist science and focuses on technical solutions with a major role for scientific experts. Little emphasis is placed on integration and multi-disciplinary approaches. In contrast, the mechanical catchment is an integrative perspective that focuses on the connections between catchment properties. However, this approach ignores or oversimplifies human impact on the environment. Decisions are made by management experts. The third approach, the complex evolving catchment recognises the "full complexity of human/community/environment interactions on a catchment scale" (Martin, 1991: 776). Strategic management is used to identify and anticipate problems. Although the social impacts of the community on the natural system are recognised, the community has little role in its management. Again, decision making power rests with the resource managers. The Catchments Project reflects several aspects of these approaches, which are also suggestive of EM: a strategic and integrated approach, a focus on technical and scientific solutions, a strong role for scientific experts and environmental managers, and a limited role for the local community in environmental management.

As an alternative to the above approaches, the 'communicative catchment' suggests a collaborative approach towards managing the environment with local communities. Some of the key aspects of such an approach include:

1. A learning environment which recognises the dynamic, uncertain and complex nature of environmental problem solving (Rogers et al., 2000; McGinnis et al., 1999). Processes should involve constant evaluation, reflection and review where necessary (Martin, 1991; Reeve, 1999). Stakeholder knowledge should be considered as relevant as the technical expertise of officials and experts, and all role-players should be encouraged to learn from one another (Bentrup, 2001; Rhoads et al., 1999).
2. Building relationships between role-players to establish trust and to facilitate decision making (Bentrup, 2001; McGinnis et al., 1999). This could be achieved by involving stakeholders in gathering information and other management activities (Bentrup, 2001).
3. The commitment and involvement of all role-players in the process (McGinnis et al., 1999).

4. The use of consensus based decision-making – ideally, the perspectives of all stakeholders should be integrated into a consensus view of the desired state of the catchment being managed (Rogers et al., 2000). It is essential to build on common points of agreement (McGinnis et al., 1999). It is here where discourse analysis could be used to identify shared discourses to stimulate a focus on areas of agreement not conflict. Mediators or formal conflict resolution processes may be necessary if agreement cannot be reached (McGinnis et al., 1999).
5. Community-based initiatives are most successful (Martin, 1999; McGinnis et al., 1999). Government can play an important role in providing the institutional structure and information, ensuring role-player representation and providing assistance for weaker parties (Bentrup, 2001). However, the community plays the most dominant role in ensuring that a united approach is taken to make real changes in how the environment is used and managed.

A 'communicative catchment' approach therefore offers considerable scope for ensuring that strong sustainability issues receive adequate attention, by involving all relevant stakeholders. However, as noted in Chapter 2, such deliberate and inclusive approaches are not without difficulties. They require considerable commitment from all role-players to be effective, and can be time consuming and costly. Those managing such a process also require certain skills. In a developing country such as South Africa, the necessary social capital is not always present to ensure that role-players can adequately voice their issues and communicate with each other. South African municipalities also lack the capacity and skills to initiate collaborative approaches, while still grappling with their new roles and responsibilities.

In spite of these limitations, it is still helpful to consider how a 'communicative catchment' approach could be implemented in the eThekwini Municipality. While planning regions were suggested earlier as units for initiating a broad catchment approach, it is uncertain when these planning regions will be established. In the long term, planning regions may well be established on a catchment basis. In the interim, however, perhaps the answer lies in the development of an incremental approach, by building slowly on what has been achieved thus far in the Catchments Project. In the context of the current complexities of municipal transformation, including capacity problems, such an approach would be more appropriate and acceptable to the municipal officials involved.

One alternative would be to link in with the Area-Based Management initiative, possibly in the Inanda-Ntuzuma-KwaMashu (INK) area, to experiment with a communicative catchment

approach. The INK area coincides with the largest catchment in the municipal area, the Umgeni River catchment. In addition to the environmental status quo assessment in the Catchments Report, considerable work on biophysical aspects of the Umgeni catchment and its sub-catchments has been undertaken by the Environmental Management Branch and the Drainage and Coastal Engineering Department. Since environmental management is one aspect of the ABM approach, it would be possible to use a communicative catchment approach in a portion of the ABM area coinciding with either the whole catchment, or on a sub-catchment basis. It would also be useful to seek ways to overlap with the catchment management work being undertaken by DCED and the Catchment Management Authority. Since ABM is a learning approach to the management of specific areas, a communicative catchment initiative could be considered as an additional learning experience for the municipality in participatory environmental governance. Should planning regions ultimately be established on a catchment basis, the municipal planners could then build on what has been learnt through this approach.

The 'communicative catchment' ideas presented here offer a way of ensuring that all role-players have an opportunity to contribute to environmental decision-making. While there is considerable promise in such an approach, there are no guarantees that improved environmental management will take place. However, it is still worth experimenting with such alternate approaches to encourage environmental policy making to move in a more strongly sustainable direction.

7.4 Conclusion

The use of a discourse approach to environmental policy making has proved to be a helpful way of assessing the prospects for strong sustainability in the eThekwini Municipality. Discourse analysis related to the eThekwini Catchments Project case study revealed that an EM approach dominates environmental discourse and practice in the municipality. Despite being clearly reflected in national policy and legislation, the strong sustainability discourse has limited representation in environmental policy making. Hajer's discourse concepts and methodology enabled the detailed analysis of the complexity of discursive interaction in the municipality, particularly the connections and disjunctures between discourses. This aided in developing an understanding of how the development of a new discourse, the catchment discourse, was influenced by the broader municipal discourses, and therefore how it also strongly reflected EM.

Discourse analysis also revealed the importance of human agency in environmental policy making. A new policy approach cannot result in changes at the level of practice, without the

active role of municipal officials to ensure its implementation. The limited institutionalisation of the catchment discourse was partly due to insufficient intervention by municipal staff to ensure that the Catchments Project was taken forward. Thus, discourses are not independent of human agency, but require the active role of individuals to be reproduced and institutionalised.

In addition to revealing the dominance of EM in the Catchments Project, this research sought an alternate approach to environmental policy making, more closely aligned with the strong sustainability discourse. It must be reiterated here, however, that EM and strong sustainability are not incompatible opposites, and that the path to sustainability is best considered as a continuum from weak to strong sustainability. A strong sustainability approach therefore needs to be added to the environmental policy work already done in the municipality, to ensure that issues of social inclusion and justice become a key part of environmental policy making.

The 'communicative catchment' provides one way to use a catchment approach to promote strong sustainability in the municipality. This requires the integration of a technical and managerial approach to the environment with local knowledge and concerns, thus the combination of instrumental and communicative rationality. If conducted properly, such an approach should pave the way for a more balanced approach to sustainability, which recognises the contributions of all role-players, and accepts that environmental problem solving should be a learning experience. Environmental policy making in South Africa is complicated by a number of factors, including a lack of appropriate skills, capacity and social capital. Local governments are struggling to come to terms with their new roles and responsibilities. Nonetheless, if positive environmental change is to take place, it must be recognised that steps need to be taken to experiment with stronger sustainability approaches. As argued by Martin (1991: 782):

> "In a world dominated by complex problems, the technical fixes employed in the past are becoming less effective. Conflicts over environmental issues and resource use have no simple solutions. They can only now be addressed by a society that accepts uncertainty and complexity and that has the patience and faith in the ingenuity of people working and learning together".

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Respondent 11, Town and Regional Planner, Housing Department - 8 May 2003.

Respondent 12, Municipal Manager - 24 June 2003.

Respondent 13, Consultant – 29 April 2003.

Respondent 14, Consultant – 7 May 2003.

Respondent 15, Consultant – 24 May 2003.

APPENDIX 1

Extracts from the eThekwini Catchments Report (Diederichs et al., 2002):

- Introduction (pages 1-2)
- Strategic Catchment Assessment Process (page 3)
- Environmental Status Quo Indicators (pages 4-5)
- Strategic Implications for Planning (pages 6-8)
- Results of the 2002 Strategic Status Quo Assessment (page 9)
- Mgeni Catchment Assessment (four pages, unnumbered)
- Umgababa Catchment Assessment (four pages, unnumbered)

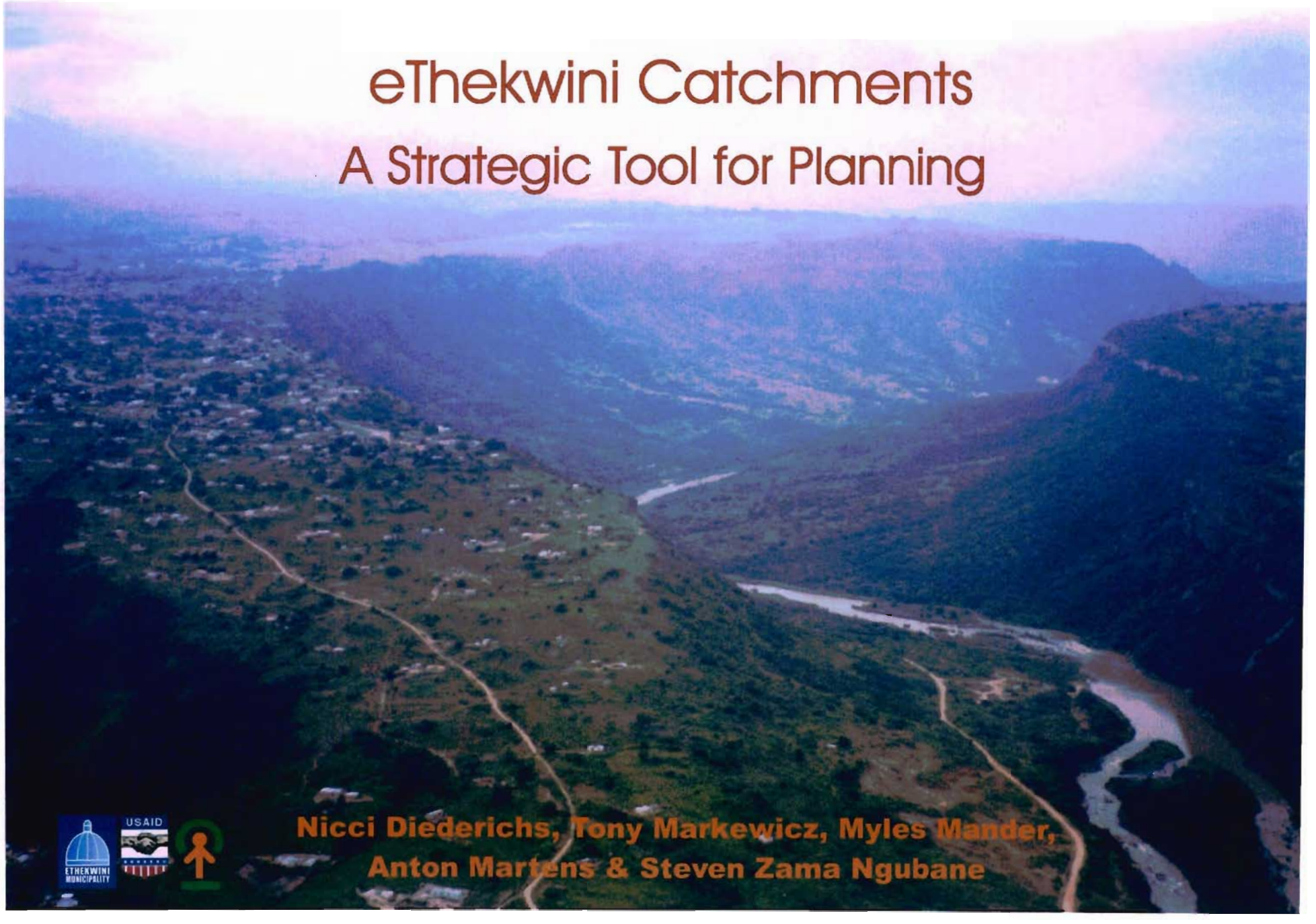
eThekwini Catchments
A Strategic Tool for Planning
USAID
ETHEKWINI MUNICIPALITY
Nicci Diederichs, Tony Markewicz, Myles Mander,
Anton Martens & Steven Zama Ngubane

Table of Contents

First Draft: June 2002

Project Management: Urban Strategy Department
Authors: Nicci Diederichs, Tony Markewicz, Myles Mander, Anton Martens and Steven Zama Ngubane.

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Introduction

Environmental sustainability and quality of life are becoming major points of focus for politicians and officials involved in planning development in South Africa. A combination of growing community awareness and new legislation guiding environment and development is the key driver behind this new focus. The reality, however, is that environmental sustainability issues are very difficult to incorporate into development planning. There are two key reasons why this is so:
1. There are few workable processes in place to guide planners towards sustainable development, and
2. Very little environmental information is available to inform planning decisions.

This document is a first step towards solving the two problems described above, presenting: a process for assessing, incorporating and monitoring environmental sustainability in strategic planning (which could be expanded to include social and economic sustainability), and base information on the status of the environment in the eThekwini Municipal Area. The approach used is based on the concept of river catchments forming strategic planning units. The reason for this approach is that many of the environmental impacts resulting from development are manifested in river systems. For instance, extensive development in an upper catchment area can cause severe flooding in coastal areas. Or, pollution from rivers and settlement can result in health problems for people downstream. So, by strategically planning development within the limits of the environmental carrying capacity of each catchment, many of the social, economic and environmental impacts can be minimised. This is a strategic approach for planning towards sustainable development that will require action by all levels of planners in the eThekwini Municipality.

The first part of the document contains a motivation for using river catchments as strategic planning units, and a process for collecting and incorporating environmental (and potentially socio-economic) information into strategic planning processes. The second part of the document contains information on the current environmental condition of each of the catchments in the eThekwini Municipal Area. The implications of the condition of each catchment for strategic area-based and sector-based planners are also presented in this section.

Why Use Catchments in Planning?

Planning integrates the social and economic priorities of an area with the environmental resources available to it. Traditionally, urban planning tended to focus on the finance, skills and infrastructure available for development. However, environmental issues are increasingly having to be addressed in development as environmental costs and awareness grow. This trend is worldwide. Consider the statistics of development in Durban: one third of the population of KwaZulu-Natal lives in Durban, two thirds of the gross geographic product is generated in Durban, and all this takes place on less that 1.4% of the land area of KwaZulu-Natal. Consequently, the environment is under heavy pressure. To put it simply, the demand for environmental services exceeds supply and we now experience:

- more frequent flooding with damage to roads and homes
- damage to stormwater infrastructure with increasing maintenance costs
- diminishing annual water flow in our rivers
- less water available for diluting industrial and residential effluent
- poor water quality in rivers and the sea with costs to health and tourism
- increasing incidence of water borne disease
- sedimentation of estuaries, causing decreased production of fish and reduced opportunities for marine-based economic and recreational activities
- unacceptable air pollution in certain areas
- fewer attractive locations for outdoor recreation despite a growing demand
- fewer areas for wild plants and animals to live in, with less opportunity for direct and indirect use
- a less attractive tourist destination with increased marketing costs
- fewer areas for food production to take place
- community opposition to new development in certain areas where environmental quality is declining
- a diminishing export market for our 'dirty' products

The above list is symptomatic of a city in which the demands of human settlement have exceeded the capacity of the natural environment (air, water and biodiversity), generating costs for the eThekwini Municipality and residents of Durban. These recurrent costs are reactive: consistent repair of damage to human settlements caused by an overstressed environment. It would be more positive to invest the city's capital developing human settlements that integrate environmental quality and sustainability with development to avoid these recurrent costs.

The impacts of development are most often generated and experienced within a river catchment. For example, the amount of sealed surface (i.e. development) in a river catchment affects the amount of stormwater that enters the river during rainfall events. The effects of increased flow in the river are experienced in the same catchment, e.g. properties and infrastructure near the coast may be flooded as a result of high levels of development in the upper catchment. Catchments are therefore a convenient unit for planning development so that the environmental carrying capacity of the catchment is not exceeded.

Catchments are important at a number of levels for planning eThekwini.

Strategic Planning

At a strategic level, catchments provide an indispensable mechanism for assessing the overall differences in environmental quality across the eThekwini area. This enables planners to distinguish between catchments in which there are conflicts between development demands and environmental service supply, and catchments in which there is spare environmental service supply capacity. This provides the basis for targeted resource allocation for development, remedial interventions and/or resource conservation.

Flooded Springfield, Mgeni River

Newspaper clipping:
Sunday Tribune May 2002

Where there's smoke, there's fire

DOSSIER: FIRES, FUMES AND TOXIC SPILLS IN SOUTH DURBAN

Painted Waste Flood Risk, Water Pollution

Integrated Development Planning

Catchments provide a useful mechanism for integrating different development sectors within a defined geographic area. This facilitates the identification of the main causes of impacts and/or development opportunities in a particular catchment and the ability to allocate resources in a more targeted, integrated and cost-effective manner.

Uninformed planning causes these problems.
They can be prevented by planning development that falls within the carrying capacity of the environment.

Area Based Management

Catchments provide a mechanism for translating environmental information into appropriate and sustainable settlement densities, land uses and infrastructure in each area. Catchments also provide a mechanism for strategic identification of areas that require intervention to protect environmental quality for surrounding or downstream users.

Land Use Management System

In terms of the Land Use Management System (LUMS), catchments provide a basis for reviewing zones, clauses, regulations and procedures in terms of their implications for urban sustainability and welfare..

Sectoral Planning

Catchments provide a mechanism for integrating the planning and investment of different service sectors within a geographically defined area in a manner that is related to the environmental quality and sustainability of specific catchments. Catchment assessments can be used to review sectoral development policies and standards as well as for budgeting and prioritisation of projects in accordance with catchment conditions.

Did You Know

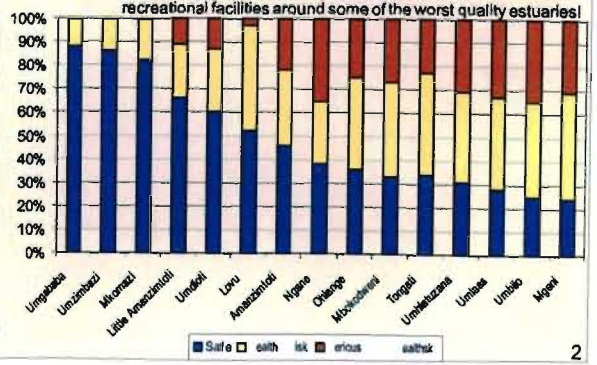
Water quality is a key indicators of environmental condition. It is particularly important because of the fact many people use water for recreation, drinking and household functions. In eThekwini, water is especially important as a source of tourism and thus economic growth.

Estuaries/lagoons are important recreational assets. The graph on the left shows the number of days per year that eThekwini's estuaries have water that is safe to use for recreation. The graph shows that the Umzimbazi, Umgababa and Mkhomazi estuaries have the most days per year in which recreation is safe (320 to 350 days). On the other hand, the Tongati, Isipingo, Mgeni, Amanzimtoti and Umlaas estuaries/river mouths have few days of the year in which the water is safe for recreation (60 to 95 days). This is insightful when one considers that there has been little investment into recreational facilities around the three best quality estuaries, and a considerable amount of investment into recreational facilities around some of the worst quality estuaries!

Flood damage: Umbilo River, Pinetown

Flood Damage: Desainagar

The graph on the right show a comparison of the average water quality in the major rivers in eThekwini as a percentage of the year that each is safe for recreation, a health riskor a serious health risk. The graph shows that the Umgababa, Umzimbazi, and Mkhomazi rivers have the safest water in eThekwini. The Mgeni, however, has the least safe water! This is significant, given that the Mgeni River supplies a large amount of drinking water to eThekwini residents, is a key water-based recreational asset (e.g. the Duzi Canoe Marathon) and is used for these purposes by a large number of people!



Strategic Catchment Assessment Process

In order to inform spatial planning so development remains within sustainable limits in a catchment, a strategic assessment of the catchment is required. The first step is to determine the 'status quo' of the catchment. This is an indication of how development has already impacted on environmental quality in the catchment. Indicators are a useful tool for making this assessment (see pages 4 & 5). The indicators can help identify:

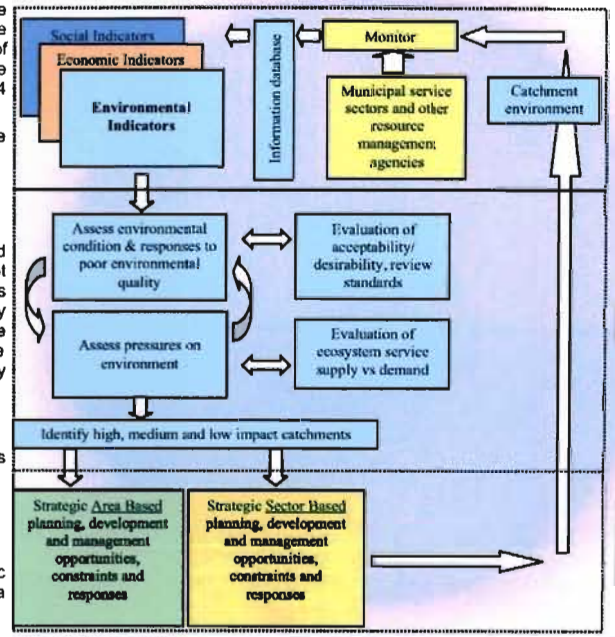
- the pressures that are being placed on the catchment environment by the levels and types of development already in place;
- the condition of the catchment as a result of these pressures;
- the social and economic responses to catchment condition.

The pressures and condition indicators usually use current standards (e.g. air and water quality standards) as yardsticks. In many cases, these standards are not adequate to ensure good environmental quality. This often results in responses such as: loss of life and property from environmental disasters; community outcries and action in response to poor quality living environments; insurance blacklistings in areas with a history of unstable environmental quality etc. The response indicators thus often point to a need to review current standards, as they may not be adequate.

The 'status quo' assessment identifies catchments that are:

- in good condition and currently developed within sustainability limits (coded GREEN);
- in moderate condition and nearing unsustainability (coded ORANGE);
- in poor condition and already unsustainable (coded RED).

Depending on this status quo, there are different levels and types of strategic planning responses that need to take place. These responses happen at a strategic area-based level or a strategic sector-based level (see pages 6 & 7).



The adjacent diagram highlights the need for constant monitoring and information collection by all Municipal service sectors and other resource management agencies (e.g. Umgeni Water, Dept of Water Affairs & Forestry). Many of the environmental indicators show change in environmental condition, pressures and response over time, so the long term application of these indicators will assist in monitoring the Municipality's performance in respect of achieving greater environmental sustainability. It is recommended that a strategic catchment assessment be conducted in eThekwini every 5 years. Suitable professionals in the fields of environment, urban planning and socio-economic issues should form the assessment team. Access to GIS information databases and aerial photographs is essential. The following table lists the information required to undertake a strategic catchment assessment & monitoring responsibilities:

Sector / Agency	Information and Monitoring Requirement
Municipal Health	Areas which clinics serve relative to catchment boundaries Type and frequency of waterborne disease Type and frequency of respiratory disease Air quality monitoring
Municipal Wastewater	Discharge points and quality of wastewater effluent Spills from pumps / flooding: frequency, location and type % catchment sewered
Municipal Parks & Recreation	Open space area, type and condition per catchment Cost of repair / maintenance from flooding per annum per catchment Costs of open space management per catchment Levels of use of open space recreational facilities Illegal dumping in open spaces
Municipal Water	Number & location of households with potable water vs those not serviced
Municipal Economic Development	Levels of household income per catchment Investment in floodplain / unstable areas Levels of expenditure on medical treatment Use and expenditure of public on open space-based recreation (e.g. beach)
Municipal Housing	% catchment population informal vs formal Demand for housing development in catchment
Municipal Rates Dept	Changes in property values over time
Municipal Transport	Transport infrastructure and traffic volumes
Municipal Urban Strategy	% catchment developed vs undeveloped Types of development/land use: industrial, housing, etc. per catchment Population figures, growth rates
Municipal Drainage & Coastal Dept	Flooding levels and frequency per catchment Loss of property and life per catchment from flooding Stormwater detention / retention capacity per catchment Costs of stabilising beach / dune erosion Dredging costs per annum per catchment
Municipal Electricity	% households serviced with electricity per catchment
Dept Water Affairs & Forestry	Water quality throughout catchment Point-source discharge points Levels of compliance with discharge permit conditions Areas of forestry per catchment Locations & volumes of groundwater abstraction Incidences of boreholes or streams drying up Areas of alien vegetation infestation Investment into managing alien infested areas Inter-basin water transfers; new dams River flow volumes and velocities over time
Dept Agriculture	Agricultural area per catchment Type, condition and productivity of agriculture per catchment Areas of alien vegetation infestation
Dept Minerals & Energy	Sandwinning and mining locations and volumes per annum per catchment
Dept Environmental Affairs & Tourism	Emissions points, composition and quality Levels of compliance with emissions permits conditions
Portnet	Dredging costs per annum
Umgeni Water	Expenditure on alien clearing in dams Treatment costs for potability
KZN Wildlife	Biodiversity composition and change over time Fish harvest: composition and volumes over time Changes in price and type of natural products traded
Public Consultation	Outdoor air quality: visual impression, health responses Visual quality and attractiveness of water resources for recreation Quality and attractiveness of open spaces for recreation

GREEN CATCHMENTS have predominantly low to moderate levels of pressure and have moderate to good conditions. These catchments are coping with current levels of pressure and environmental quality remains relatively good. Management and proactive action is required in:

- Managing areas providing environmental services.
- Managing current land uses.
- Proactive planning for appropriate type, location and design of new developments that will not increase the pressures on the catchment to a point where environmental quality declines (development should be combined with bolstering of environmental service supply).

ORANGE CATCHMENTS have a combination of low and high levels of pressure, and have poor, moderate and good conditions. These catchments are being stressed by current land use and condition has been affected. Changes in land use and new developments may increase the levels of pressure on the catchment to a point where environmental quality declines substantially. In this case the catchment could decline to rating of 'RED'. A combination of remedial, management and proactive action is required in:

- Increasing management investment into areas providing environmental services, particularly for services under pressure;
- Identification and management of polluting / high impact land uses;
- Careful planning, control and design of new developments to maintain and enhance environmental quality in the catchment.

RED CATCHMENTS have predominantly moderate to high pressures and poor to moderate conditions. These catchments are under stress and the environmental quality of the catchment has already declined significantly. Remedial and management action is required in:

- Increased investment into bolstering and managing areas providing environmental services;
- Identification and management of polluting / impacting land uses;
- Stringent control and careful design of new developments to avoid worsening the conditions in the catchment.

Environmental Status Quo Indicators

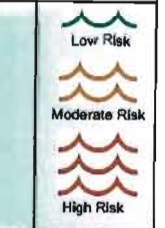
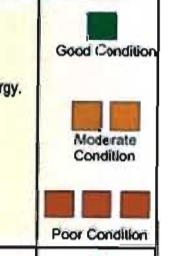
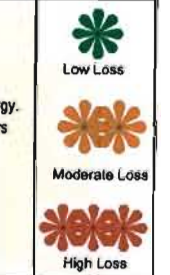
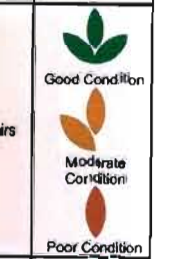
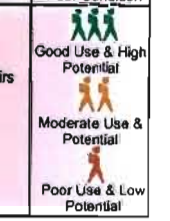
A strategic catchment assessment should undertake to evaluate the social, economic and environmental situation in the catchment. This study, however, has focused on providing a tool for assessing the environmental status of catchments. The eThekwini Municipality should expand this tool to incorporate the social and economic information required. The following table of indicators must be used to undertake the first stage of the strategic catchment assessment process: 'status quo catchment assessment'. The indicators are presented within the terms of 8 environmental themes:

- Air Quality: Refers to the visual quality, odour and actual chemical quality of the air. Important for health, quality of life and tourism potential.
- Water Quality: Refers to the visual quality and actual chemical quality of river and sea water. Important for health, recreation and costs of treating for consumption.
- Water Quantity: Refers to the amount of water in a river, wetland, groundwater etc. Often affected by water consuming activities (abstraction, forestry etc.). Important for health, water supply and agricultural production.
- Flood Risk: Refers to the potential for flooding to occur. Important for human health and safety, risk to economic assets and potential infrastructural damage.
- Sedimentation/Erosion: Refers to a change in the natural sediment regimes of rivers and beaches, and to unnatural soil erosion on land. Important for agriculture, risk to economic assets and potential infrastructural damage.
- Loss of Biodiversity: Refers to the reduction of floral and faunal biodiversity. Important for recreation/tourism, property values & conservation.
- Agricultural Production: Refers to productivity and diversity of agricultural activities. Important economic and human health consideration.
- Recreational/Cultural/Educational Use: Refers to the quality, accessibility and diversity of recreational/cultural/educational natural assets.

These 8 themes are evaluated in terms of pressure, condition and response (see page 3). Information from the table on page 3 must be collected before the indicators can be applied in the status quo assessment. Relevant norms and standards are used as the yardsticks against which the indicator information is compared. Known norms and standards are presented in the column third from the right. Where the indicators show that the environmental condition is in line with the relevant standards, but there are still negative responses, the standards are not adequate and must be reviewed. Certain authorities are responsible either these standards, or for collecting the information relating to an environmental theme. These 'Responsible Authorities' are listed in the column second from the right.

For ease of reading, each of the environmental themes has been allocated a symbol that is used to represent the condition of that theme in the catchment (good, moderate or poor). Colour coding is used (green: good, orange: moderate, red: poor) as well as repeated symbolisation. For instance,

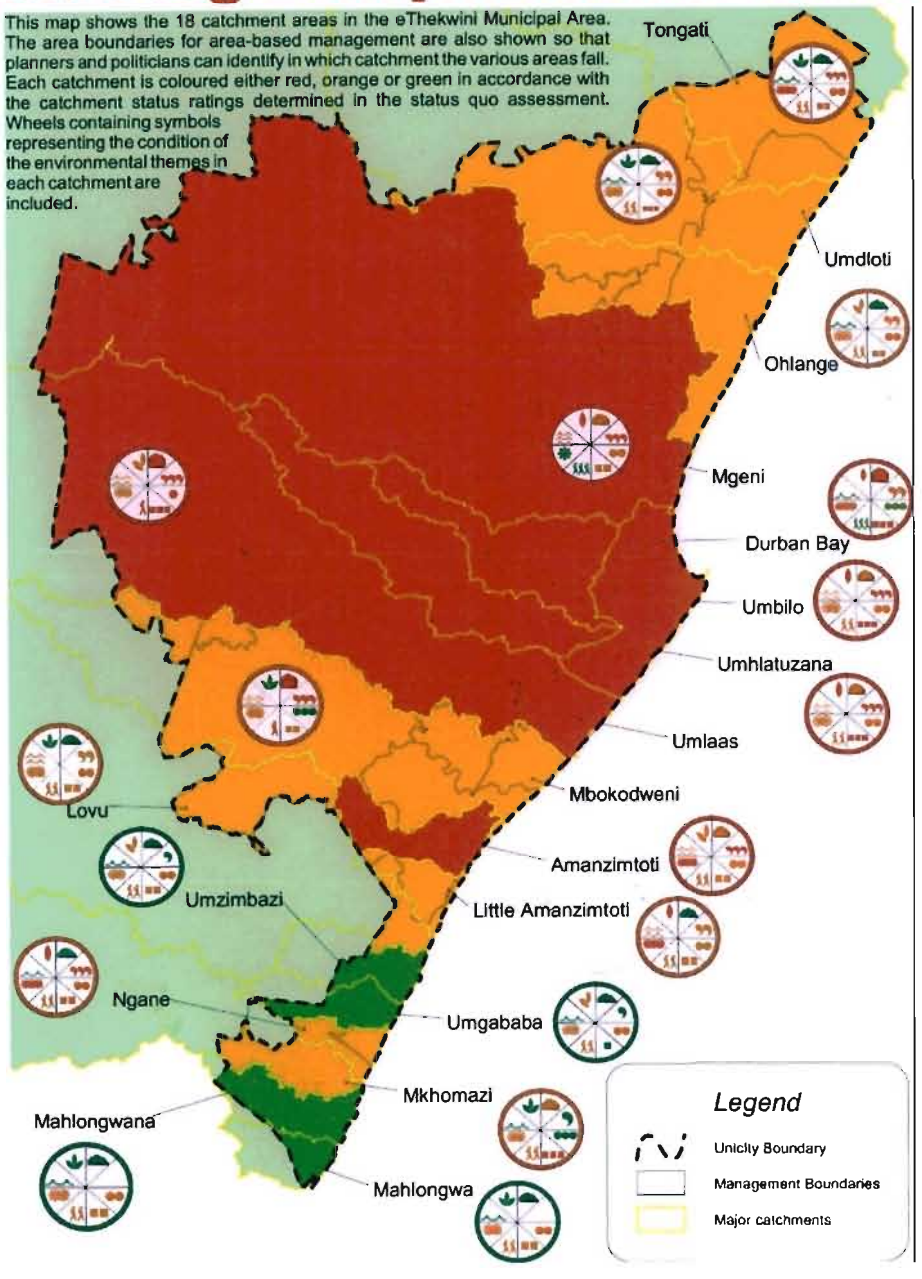
Theme	Status Quo Indicators			Standards	Responsible Authorities	Symbol
	Pressure	Condition	Response			
Air quality	• Extent of industrialisation and transport infrastructure. • Coverage, diversity and location of natural ecosystems relative to emissions. • Topo-geographical conditions for atmospheric dispersion. • Number of emissions permits. • Frequency of exceedances of emissions permit conditions by industry. • Level of air quality monitoring, thus levels of control of emissions permit conditions. • Coverage of non-electrified settlement, crops and natural habitats that require burning (sugar cane, grasslands). • Landfill sites, wastewater treatment works, quarries etc. with potential odour and dust nuisance.	• Outdoor air quality: visual and odour nuisance. • Pollutant concentrations in the atmosphere. • Acid rain.	• Incidences of lung & respiratory diseases and allergies. • Medical expenditure on lung & respiratory related illness of communities. • Change in tourism and recreational use with change in air quality. • Change in property values with change in in air quality. • Community action against poor air quality. • Costs associated with mitigatory actions (eg increasing stack heights).	• Atmospheric pollutant concentrations and emissions standards.	• Department of Environmental Affairs & Tourism - emissions standards. • City Health - air quality monitoring. • Industry - control of emissions quality.	Good Condition Moderate Condition Poor Condition
Water quality	• Range, extent and number of pollutant, nutrient and sediment discharges from point and non-point sources relative to river length and flow. • Levels of acid rain or other atmospheric pollutants contained in rainwater. • Frequency of exceedances of discharge permit conditions (spills or regular exceedances by certain industries). • Risk of spills from transport infrastructure and pipelines. • Seasonally closed estuary, concentrating pollutants.	• Visual quality and potability of surface and ground water. • Nutrient & chemical loads and/or bacterial contamination. • Algal blooms and alien species invasions. • Rate of fish kill incidents.	• Treatment costs for achieving potability. • Incidences of water-borne disease (e.g. cholera). • Change in recreational/tourist use with change in surface/marine water quality. • Costs associated with clean-up of alien species invasions and algal blooms.	• Surface and groundwater quality guidelines. • Estuarine and marine water quality guidelines. • Potability standards. • Discharge regulations and standards. • Minimum instream flow requirement standards.	• Dept Water Affairs and Forestry - effluent discharge permits. • Umgeni Water - water quality moniroing. • Metro Water & Waste - water quality monitoring. • Metro Wastewater - control of effluent quality. • Industry - control of effluent quality. • Dept Agriculture - control of agrochemical use/farming practice. • All planning, development control Depts - control of polluting landuses.	Good Condition Moderate Condition Poor Condition
Water quantity	• Levels of water abstraction relative to availability. • Dams retaining flow and losing water to evaporation. • Coverage of forestry, alien vegetation or other water consumptive land uses in catchment. • Coverage of wetlands and floodplains in catchment. • Coverage of sealed surfaces in catchment. • Steep topography with low infiltration potential.	• Change in flow levels over time, perennial streams become non-perennial & visa versa. • Incidences of estuary mouth closure if not previously the case. • Incidences of boreholes drying up. • Wetlands and floodplains showing intrusion of dryland species (i.e. start drying up).	• Change in agricultural production where irrigation is required. • Costs (or change in costs) of potable water with inter-basin transfers and more dams are constructed. • Incidences/change in incidences of bilharzia and malaria with change in flow velocities in rivers/streams. • Change in recreation and tourism potential in rivers with change in flow velocities. • Cost of breaching closed estuaries.	• Minimum instream flow requirements. • Abstraction standards.	• Dept Water Affairs and Forestry - dam authority & control,abstraction permits,forestry permits. • Umgeni Water - dam monitoring and control. • Dept Agric & Env - EIA enforcement. • All planning, development control depts - control of hard surfacing land uses.	Good Condition Moderate Condition Poor Condition

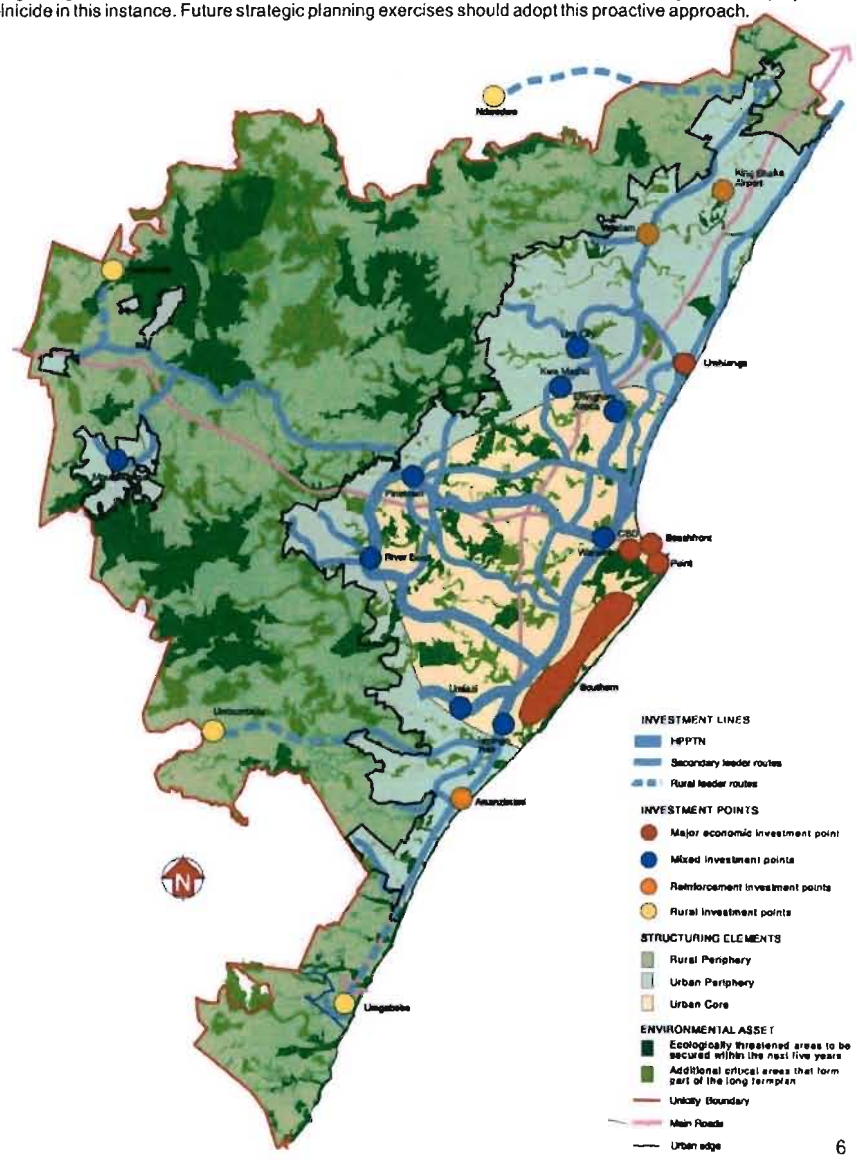
Theme	Status Quo Indicators			Standards	Responsible Authorities	Symbol
	Pressure	Condition	Response			
Flooding Risk	* Coverage of sealed surfaces in catchment. * Coverage of poorly vegetated unsealed landscape (e.g. agriculture with low vegetative coverage, degraded lands). * Levels of stormwater detention and retention in catchment: coverage of dams, wetlands and floodplains, stormwater infrastructure with/without detention facilities, levels of on-site stormwater conservation/detention. * Topography causing/reducing accelerated run-off. * Portion of catchment outside municipal boundary: upstream activities that affect flood risk downstream.	* Frequency and intensity of flooding relative to 1:10/50/100 year standards. * Flash flood frequency during high rainfall events. * Levels of scour of streams, rivers and estuaries.	* Level and frequency of flood damage. * Expenditure on flood damage repair to infrastructure and property. * Blacklisting of properties against flooding by insurance companies. * Any loss of life associated with flooding in catchment.	* 1:10 year, 1:50 year, 1:100 year floodlines.	* Department of Water Affairs and Forestry. * Local authorities: Stormwater Management Departments.	
Sedimentation / Erosion	* Agricultural practice in catchment: adequate/inadequate soil conservation controls. * Coverage of alien vegetation, forestry or annual harvest crops such as sugar cane. * Mining and sandwinning activities in catchment. * Quality and extent of vegetative coverage in catchment. * Levels and frequency of flooding in rivers. * Levels of streambank vegetation disturbance. * Number and size of dams and weirs acting as sediment traps. * Erosivity of soil types and topography. * Level of construction activities in catchment.	* Levels of river and stream incision. * Evidence of erosion dongas, gullies or sheet erosion. * Rates of siltation of dams, estuaries, rivers, canals, harbours, wetlands and floodplains. * Beach erosion. * Turbidity and sediment loads in rivers. * Incidences of slumps, landslips and landslides.	* Dredging frequency and costs for estuaries, rivers, canals, harbours and dams. * Costs for repair, loss of property and life from incidences of slumps, landslips and landslides. * Investment and costs for mitigating beach erosion (e.g. groynes, earthworks, infrastructural damage in adjacent areas). * Many sandwinning operations in middle and lower reaches of catchment indicates high sediment loads from upstream.	* Soil conservation and good agricultural practice guidelines. * Mining standards and guidelines.	* Department of Minerals and Energy. * Department of Agriculture. * Local authorities: Stormwater Management Departments.	
Loss of Biodiversity	* Unsustainable harvesting practices. * Levels of infrastructure and services in urban areas: reliance on natural products. * Demand for food security or economic gain from agriculture, fishing. * Population figures and growth rates, with associated demand for land for development. * Demand for economic growth, with associated pressures on land for industrial/commercial/infrastructural development. * Prioritisation and management of natural areas by local authorities/landowners. * Coverage of protected open space. * Access to solid waste disposal services: likelihood of illegal dumping	* Extinction or change in scarcity of species. * Change in populations of migratory bird species over time. * Areas invaded by alien species or disturbed by illegal dumping. * Change in diversity and volumes of fish harvested. * Slash and burn agriculture found or encroaching in large areas. * Areas of former forest reduced to scrub by heavy harvesting pressure.	* Change in or high values of natural products traded in the open market - indicates scarcity. * Levels of investment and management costs associated with managing alien vegetation encroachment, e.g. Working for Water. * Levels of and change in tourism and recreational use of natural areas. * Community conservancies and lobbies for conservation.	* Municipal by-laws on illegal dumping. * National/provincial/local service standards. * Fishing bag limits. * Sustainable harvesting guidelines for medicinal plants. * Weeds Control Act.	* Department of Water Affairs and Forestry. * Department of Minerals and Energy. * Department of Environment Affairs and Tourism. * Conservation Authorities: KZN Conservation Services. * Local Authorities.	
Agricultural production	* Levels of or change in cover of urban land use. * Agricultural practice: adequate/inadequate soil conservation controls. * Frequency of harvesting and levels of recycling of vegetative matter to soil, resulting in change in soil fertility over time. * Change in flooding of floodplains as a result of dams, canals etc. * Change in water quality and quantity available for irrigation. * Change in pollinator habitats near to agricultural lands. * Topography and soil erosivity.	* Change in productivity of crops over time. * Frequency/change in frequency of outbreaks of pest species. * Areas of former farmlands left fallow or used for alternative purposes.	* Levels of or change in input costs. * Change in returns on produce. * Cost/change in cost of produce in local markets with need to import from other areas.	* Agricultural Bioresource Units. * Water harvesting, soil conservation, agricultural management guidelines.	* Department of Agriculture. * Department of Environmental Affairs and Tourism.	
Recreational/Cultural/Educational Uses	* Population/user demand to recreational asset ratio. * Prioritisation, management and investment into recreational/cultural/educational assets.	* Levels/change in levels of usage of environmental assets for recreation, cultural experience or education. * Quality and safety of assets. * Accessibility of recreational assets and distribution relative to population distribution. * Diversity and capacity of recreational assets.	* Levels or change in levels of investment into recreational/cultural/educational assets and events. * Returns or change in returns from receational and tourist assets. * Costs or change in costs to locals for recreation (have to travel further or pay more).	* Area per population required for recreation.	* Department of Environmental Affairs & Tourism. * Local authorities. * Private land owners.	

Strategic Implications for Planning

The following map forms the basis of the Spatial Development Framework for the eThekwini Municipal Area (May 2002). The Spatial Development Framework is the spatial response to the Long Term Development Framework (LTDF) and Draft Integrated Development Plan (IDP) prepared for the eThekwini Municipal Area.

To determine the implications of the status quo of eThekwini's 18 catchments for strategic planning, the Spatial Development Framework map has been analyzed against catchment status quo information. This approach is reactive rather than proactive. A proactive approach would have been to use catchment status quo information to assist in guiding the development of the Spatial Development Framework. However, the timing of the two projects did not co-inicide in this instance. Future strategic planning exercises should adopt this proactive approach.





SPATIAL IMPLICATIONS OF CATCHMENT CONDITION

Environmental quality varies spatially within the Municipal Area. Multifaceted strategies will thus be required to remedy or mitigate environmental impacts. Environmental service assets and service levels vary between catchments, but they also vary between the lower, middle and upper reaches of the catchment.

The catchment status quo assessment has shown that the majority of the 18 catchments in the eThekwini Municipal Area have urban development demands that exceed, or are rapidly approaching levels that exceed, environmental service supply. This implies that intervention on a number of levels and fronts by all the Municipality's stakeholders is needed. A set of coordinated, cooperative remedial, preventative and developmental actions must be implemented to ensure a good future quality of living and working environments in the Municipal Area.

Existing and Proposed Urban Settlement Areas

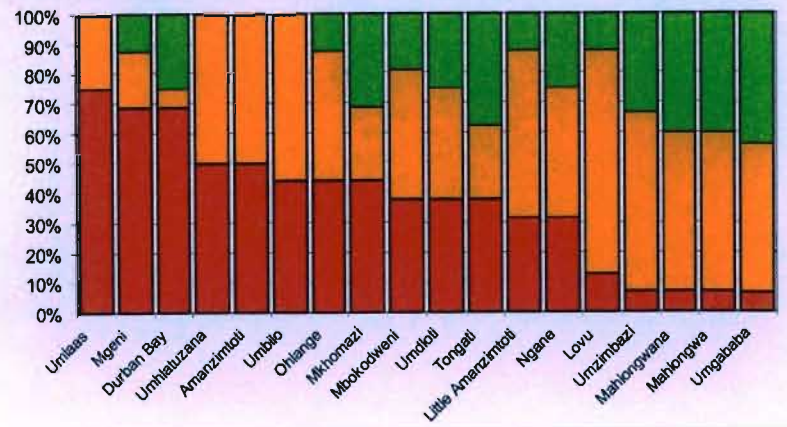
The majority of urban development occurs within the lower reaches of the catchments on the flatter and more accessible coastal plain. As a consequence of the geophysical and infrastructural suitability of the coastal plain for settlement, future development will intensify in these areas and place additional pressure on the natural resources and infrastructure. The existing urban settlement areas have severely eroded environmental resource bases within them and they are, in most cases, located downstream of the functional upper catchment environmental resource bases. These areas will therefore require concerted environmental management and associated infrastructural investment to both remedy existing poor conditions and prevent future additional impacts on environmental quality.

Rural Areas

The rural areas on the periphery of the Municipal Area are mostly located in the upper and middle reaches of river catchments. These settlements are situated on fragmented and steep topography. It is imperative for both the environmental quality of the settlements and the avoidance of downstream impacts that settlement density, land use types and activities are assessed, monitored and managed appropriately.

The Best and The Worst

The 18 catchments in eThekwini each have unique pressures, conditions and responses. By applying the indicators on pages 4 & 5 to each of the catchments, the status quo of each catchment was determined. Depending on whether the pressures, conditions and responses were high/moderate/low, or poor/moderate/good, they have been rated as red, orange or green. For each of the catchments, the percentage of red, orange and green pressures, conditions and responses have been presented in the graph below. From the graph, one can see that the Umlaas catchment has the poorest environmental status. None of the indicators are green (good environmental condition, low pressures and no negative responses) for this catchment! At the other end of the scale, the Umgababa catchment has the highest percentage of green indicators. A very low percentage of the indicators were red (poor environmental condition, high pressures, and negative responses). The Umgababa catchment can thus be considered to have the best environmental status in eThekwini.



Agricultural Areas

Agricultural activity exists in complex spatial patterns and sectoral systems throughout the Municipal Area, but the commercial or intensive activities are invariably located on the Municipal periphery. These activities need to be carefully monitored in terms of their impacts on environmental quality in downstream areas. With careful management and sustainable agricultural practices they can become an environmental asset that assists or enhances the supply of environmental services. These areas also play an important role in the economic base of the Municipal Area and surrounding region. The erosion of good quality agricultural land by alternative forms of land use needs to be carefully assessed against the overall longer term viability or sustainability of other settlement options.

MANAGING MAJOR EXTERNAL INFLUENCES

Many catchments have significant land areas falling outside the Municipality's area of jurisdiction. The consequence for the Municipality is that it has to pick up the cost of mitigating the impacts it generates internally from its own development initiatives, and also the costs of impacts from areas located upstream (in some cases as far as the Drakensberg Mountains). The Mgeni, Umlaas and Mkhomazi are good examples of large catchments with extensive settlement and agriculture upstream that has an impact on catchment quality in eThekwini.

Current planning-related legislation provides for the coordinated and integrated development of municipal areas. The eThekwini Municipality should use the full force of these instruments to establish effective engagement with adjacent local government structures and with relevant provincial and national government agencies to ensure that the environmental quality of the eThekwini Municipal Area is protected. This could potentially be conducted through Catchment Management Agencies (CMA's) sometime in the future, but the eThekwini Municipality needs to take its own action as soon as possible.

MANAGING INDIVIDUAL CATCHMENTS

Physical Characteristics

Specific management approaches and strategies will need to be determined for each catchment since each has its own physical characteristics in terms of size, hydrology and geophysical profile (soils, rainfall, slopes etc). These characteristics should be used to determine "customised" strategies and tools for land use and environmental management.

Sub Catchments

The larger catchments such as the Mgeni and the Umlaas have sub-catchments that are larger than some of the other 18 catchments in the Municipal Area. These have their own physical characteristics and, more importantly, have very different settlement and development profiles despite being part of the same catchment. These need to be accorded appropriate recognition and assessed individually. Appropriate sub-catchment management strategies should be identified so as to ensure that management is effective and efficient.

ENVIRONMENTAL QUALITY MONITORING STRATEGIES

The study has revealed that the current levels of information as well as the monitoring systems for various indicators that are required for accurate and ongoing evaluation of the state of the environmental quality, are inadequate. Thus it is imperative to any future endeavour at improving the state of the environmental quality within the Municipal Area that effective and efficient monitoring systems be established for each of the various indicators that assist in understanding the state of environmental quality (see page 4 & 5).

STRATEGIC ASSET IDENTIFICATION

The strategic catchment assessment process has enabled the identification of strategic assets that contribute to the environmental quality of the Municipal Area.

Environmental Assets

In the first instance the natural environmental resource base is a prime asset which the Municipal Area currently enjoys at no direct cost. This asset which is in the ownership of many organisations and individuals has a capacity to provide a significant part of the solution to the current state of the environment and the direct and indirect costs related to improving and / or maintaining its condition and performance for human habitation. The asset consists of major inland and intact terrestrial habitats in the west, and the riverine, estuarine and marine ecosystems in the east. Each of these systems plays an important role, both individually and collectively, in the urban ecosystem and their ongoing protection and enhancement is critical to achieving the vision of a quality living environment in eThekwini.

Installations

The Municipal Area has key installations that play a role in both sustaining its residents through the provision of essential services and in ensuring environmental quality. These include the major dams and the harbour. In instances where these installations are not managed by the Municipality, a concerted and sustained effort should be made to ensure that their planning, development and management is integrated with the environmental objectives and initiatives of the Municipality.

Settlement Areas

Finally, each of the various types of settlement that occur within the Municipal Area should be conceptualised strategically as assets that contribute to the achievement of good environmental quality in eThekwini. These settlements consist of land uses and infrastructure that, if appropriately serviced and managed by residents and authorities, can minimse pressures on environmental service assets and limit required expenditure on "mop up" initiatives.

SETTLEMENT PLANNING, DEVELOPMENT AND MANAGEMENT APPROACHES

Guidelines have been prepared for the design and development of human settlements by a host of government agencies. These form part of the standards and norms by which settlements are established. However, given the findings of this study, their appropriateness with respect to sustainability needs to be reviewed.

In short, the intellectual and technological capacity to remedy existing shortcomings and to effectively prevent future impacts is available. All that is required is:

1. an acknowledgement by the Municipality's leadership of the fact that eThekwini's environmental quality is severely compromised, and
2. follow-up commitment, with resources directed towards systematically improving the current situation.

The long term benefit of reducing expenditure on remedial action could result in more positive expenditure on developmental initiatives.

WHAT HAPPENS IF WE DON'T RESPOND TO THESE ISSUES?

★ Rapid erosion of development opportunities related to environmental service assets and reduction in the capacity of catchments to support future development.

★ Direct impacts on the health and overall quality of life of eThekwini residents and visitors with respect to air and waterborne diseases and the consequent reduction in attractiveness of eThekwini as a place of residence and investment location.

★ Impacts on the Tourist Economy through reduction in the character of eThekwini, particularly the quality of the water-related recreation events and activities e.g. Ocean, Mgeni River, Harbour.

★ Recurrent costs to the Municipality to ameliorate impacts by "fixing up" will increasingly detract from investment into new developments.

SO WHERE TO FROM HERE?

➤ Create political awareness and political commitment through the allocation of budget and resources to respond to catchment status quo issues.

➤ Create public awareness with regard to the contribution that individuals and organisations can make towards improving environmental quality and the benefits of an improved environment.

➤ Incorporation of the findings of the catchment status quo assessment into the Long Term Development Framework, Draft IDP,Area Based Management Initiatives and Sectoral Planning and Programming Processes.

➤ Establish appropriate settlement development principles, guidelines and procedures that can be used to develop and / or manage new and existing settlement.

➤ Establish effective integrated inter-sectoral monitoring and information systems for regular generation and assessment of environmental indicators.

	10 Major Strategic Development Issues Identified in the eThekwini Municipal Area
1	The proposed intensification of the urban core and urban periphery will increase the pressures on the environment with a likely decline in environmental quality. It is thus essential to both manage and increase the capacity for environmental service supply throughout the affected catchments.
2	The proposed intensification of the urban core and urban periphery also has major implications in terms of the need to provide adequate infrastructure capacity and impact mitigation measures to augment the diminished environmental service supply and to protect environmental quality in the high value coastal strip.
3	Many of eThekwini's larger catchments extend far inland, with the bulk of the catchment falling outside of eThekwini's administrative control. The eThekwini Municipality needs to engage with authorities outside of the municipal area to ensure that adequate land use management is implemented in these upper catchment areas to protect the high value and intensive development in eThekwini.
4	Intensive coastal development has diminished the coastal open space asset and resulted in major pressure on the limited assets for recreation/tourist use. Strategic recreation and tourism opportunities exist in the remaining large inland open spaces (with associated economic opportunities), such as game parks and eco-tourism facilities. These large open spaces should also be protected/managed as environmental service supply areas buffering the impacts generated by land uses outside (upstream of) eThekwini.
5	The majority of catchments within the municipal area are already in the red or will become red if current development pressures continue, which indicates that the ability of the natural resource base to provide environmental services is already over-subscribed and needs to be augmented or impacts need to be reduced. This is essential if the eThekwini Municipality intends to avoid negative economic and social responses to poor environmental quality (e.g. community outcries in the Durban South Basin).
6	The rural and agricultural areas on the urban periphery need to be proactively planned for and developed in a way that protects the environmental quality of the downstream catchment and high value development in the coastal strip.
7	The manner in which settlements are planned, developed and managed will need to be reviewed to ensure that the off-site impacts of developments are reduced and that environmental quality is maintained and, where possible, enhanced.
8	The larger catchments within the eThekwini Municipal Area, such as the Mgeni and Umlaas River catchments, contain a number of significant sub-catchments with varying conditions that require a variety of management responses. The eThekwini Strategic Catchment Assessment should be undertaken at a more detailed level to identify specific management responses within each sub-catchment.
9	The monitoring (information collection) systems that supply the necessary information for application of the catchment indicators should be improved. This will allow ongoing assessment of the trends in catchment status quo over time. These trends can be used to determine changes in environmental service delivery, associated costs to the municipality/residents and future development potential within the municipal area.
10	Key strategic assets that need to be protected through adequate land use and catchment management include the Inanda Dam (eThekwini's major water source), the "Golden Mile" beachfront (Durban's main tourism asset), Durban Bay estuary (eThekwini's main estuary and a major investment area) the Mgeni River and estuary (major recreational and ecological assets), coastal environmental quality along the eThekwini's north coast for future urban and tourism growth.

Catchment	Type	Strategic Response	Affected Catchments
Size	Large	Maintain large and/or functional environmental service areas in upper portions of the catchment to act as a buffer protecting the eThekwini Municipal Area from upstream impacts and to protect the environmental quality of downstream coastal developments and amenities.	Mgeni, Umlaas, Mbokodweni, Lovu and Mkhomazi Catchments.
	Medium	Secure the remaining environmental service areas and link to create an integrated open space system that can deal with development impacts.	Tongati, Umdloti, Ohlange, Durban Bay, Umbilo, Umhlatuzana Catchments.
	Small	Secure the remaining environmental service areas and enlarge where possible/necessary to ensure that development pressures do not exceed the carrying capacity of the catchment.	Amanzimtoti, Little Amanzimtoti, Umzimbazi, Umgababa, Ngane, Mahlongwana and Mahlongwa Catchments.
Condition	Red	Exercise strict control to ensure that the catchment condition does not deteriorate further. Aim to improve status to orange: undertake infrastructure upgrading, boost supply of environmental services (through better management and/or rehabilitation), ensure internalisation of costs of environmental protection (flood detention, water quality etc.) of new developments, identify high impact land use areas and implement mitigation measures.	Mgeni, Durban Bay, Umbilo, Umhlatuzana, Umlaas and Amanzimtoti Catchments.
	Orange	Ensure that the catchment condition does not deteriorate to a red status by providing appropriate levels of infrastructural services, by boosting the environmental service supply, by controlling land use and designing settlements appropriately to minimise impacts.	Tongati, Umdloti, Ohlange, Mbokodweni, Little Amanzimtoti, Lovu, Umzimbazi, Ngane and Umkhomazi Catchments.
	Green	Encourage low impact land uses and activities (e.g. tourism/recreation) that capitalise on the good environmental quality. Proactively plan to ensure development does not undermine the good environmental quality.	Umgababa, Mahlongwa and Mahlongwana Catchments.
Location	North	Major new urban growth trend that needs to be managed to ensure that catchment condition does not deteriorate.	Tongati, Umdloti and Ohlange Catchments.
	Central	Major ongoing growth in existing highly developed catchments that needs to be managed to ensure that catchment condition does not deteriorate further.	Mgeni, Durban Bay, Umbilo, Umhlatuzana, Umlaas, Mbokoweni, Amanzimtoti and Little Amanzimtoti Catchments.
	South	Little or no urban growth with opportunities for tourism and recreational development based on high coastal environmental quality.	Lovu, Umzimbazi, Umgababa, Ngane, Mkhomazi, Mahlongwana and Mahlongwa Catchments.

RESULTS OF THE
2002 STRATEGIC STATUS QUO ASSESSMENT

The catchment information presented in the following section is a combination of collected information and results from a strategic status quo assessment of catchments in eThekwini undertaken in early 2002. There are 4 pages of information for each of the 18 catchments in eThekwini.

PAGE 1

This page presents an aerial photograph map of the relevant catchment, and a number of oblique pictures of various aspects of the catchment. The pictures and map are aimed at providing the reader with a sense of the catchment topography, predominant land uses and any other interesting features.

PAGE 2

This page provides general information about the catchment and some of the results of the status quo assessment, including:

- the overall rating of the catchment: red, orange or green;
- a statement on the status quo of the catchment (positive and negative aspects);
- a symbolised summary of the condition of each environmental theme in the catchment;
- the size of the catchment;
- the percentage of the catchment that falls inside and outside the eThekwini boundary;
- the percentage land area that the catchment occupies of the eThekwini Municipal Area;
- a list of key settlement areas and land uses in the catchment;
- a pie chart showing the break-down of land uses in the catchment;
- population information;
- a graph showing levels of servicing;
- a list of key environmental service assets/open spaces and the land area that they occupy as a percentage of the entire catchment land area;
- the environmental services that these environmental service assets/open spaces supply.

PAGE 3

This page presents the results of the catchment status quo assessment. The table is formatted in a similar way to the status quo indicators: pressure, condition and response as the three column headers at the top, and the 8 environmental themes as row headers on the left. Colour coding (red/orange/green) has been used to show whether the pressures, conditions and responses for each of the environmental themes are high/moderate/low or poor/moderate/good. The relevant symbol showing the condition of the theme is represented in the left-hand column. Essentially, the more green visible on the page, the better the catchment status quo. The more red that is visible on the page, the worse the catchment status quo.

PAGE 4

The table presented on this page is a summary of the key findings of the study with regard to: -

- Environmental Opportunities and Constraints associated with the catchment.
- Long term Spatial Development scenarios for eThekwini and their implications for the catchment.
- Anticipated environmental impacts that could arise if future development scenarios go ahead without appropriate management of each catchment condition.

The third column in the table identifies strategic issues that need to be addressed and interventions that will need to be made if the catchment environment is to be managed for the benefit of eThekwini's inhabitants. The interventions are related to three sectors of management: Land use planning and Land Use Management; Environmental Service Asset Planning and Management; and Infrastructure Planning and Management.

The fourth column identifies the municipal agencies that should lead the intervention process. This column also identifies the agencies that should initiate and sustain the review of their roles and responsibilities in the following planning functions:

- Planning and management procedures and processes within their own sectors, and between themselves and other municipal and / or other stakeholder agencies.
- Sectoral planning policy and development standards.
- Development and budgeting priorities and programmes.

The table below provides guidance on the focus of the abovementioned review.

LONG TERM DEVELOPMENT FRAMEWORK	Vision	Strategic Review of the Vision using the Catchment Status reports to determine responses in terms of environmental responsibility and accountability.
	Objectives	Review of each in terms of balance between environmental, social development and economic development objectives in relation to the opportunities and constraints.
	SDF	Review in terms of the spatial impacts of proposed spatial development on each catchment in terms of the response to both opportunities and constraints.
AREA BASED MANAGEMENT • **Area Based Maintenance** • **Area Based Development**	LDP's	Review planning processes to ensure that environmental informants are drawn from the catchment assessment and translated into appropriate settlement density, land use and infrastructure proposals.
	Precinct Plans	As above but with more detailed inputs.
	LUMS (i.e. Planning Schemes)	Review zones, clauses, regulations and procedures in terms of their response to environmental quality control and monitoring required.
SECTOR PROGRAMMES 1. **Economic Development** 2. **Housing** 3. **Transportation** 4. **Infrastructure** • **Parks/ Recreation**	Procedures and Processes	Review planning processes and procedures in terms of integration with relevant environmental databases and Catchment Status reports.
	Policy and Standards	Review development Policy and Standards with respect to their contribution and/or response to opportunities and constraints identified within Catchment Status reports.
	IDP Programme Priorities	Review budgeting and prioritisation with respect to Catchment Status reports and also to Policy and Standards.


Mgeni River Catchment
Superb undeveloped environmental assets
Steep terrain open space in hinterland
Bisasar Rd Landfill Site
Dense formal & informal settlement
Inanda Dam & peri-urban settlement
Infill on floodplains
Kwamashu
Ntuzuma
Mgeni
Low cost housing along Mgeni corridor
Formal residential
Mgeni Estuary & recreational-residential investment
Industry on floodplains

Catchment Rating: Red

Status Quo Statement: Mgeni River Catchment

The Mgeni River Catchment contains a wide variety of land uses and settlement densities. The steep land in the upper reaches is largely undeveloped. The middle reaches contain varying densities of formal and informal settlement, urban centres, industry and agriculture. The lower reaches contain concentrated infrastructure, urban settlement and recreational assets. Levels of servicing in the catchment are moderate to high, being concentrated in the middle and lower reaches. Substantial environmental resource asset remains in the catchment and is located primarily in the upper reaches of the catchment, in riverine corridors, the coastal zone and large protected open spaces.

Negative environmental aspects of the catchment are:

* **High pressures and moderate condition of air quality in the middle and lower reaches of the catchment.**
* **Diminished river flow and poor water quality in the river and estuary.**
* **High flood risk in certain localities.**
* **Sandy soils and steep slopes with high erosion risk; Turbid water and high rates of sedimentation on floodplains, in Inanda dam and the estuary.**
* **Limited and decreasing agricultural production with urban expansion.**

Positive environmental aspects of the catchment are:

* **Localised biodiversity assets.**

Summary of Conditions

Water Quality: Poor

Flooding Risk: High

Agricultural Production: Poor

Water Quantity: Moderate

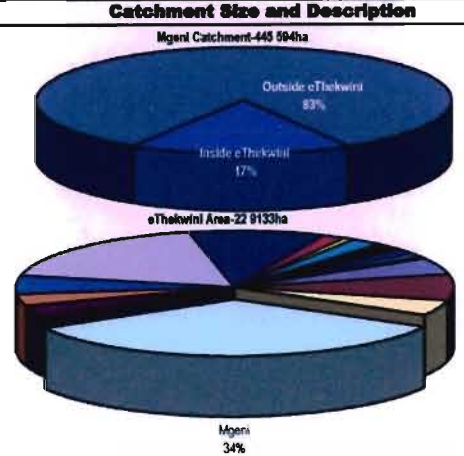
Air Quality: Moderate

Sedimentation & Erosion: Moderate

Loss of Biodiversity: Low

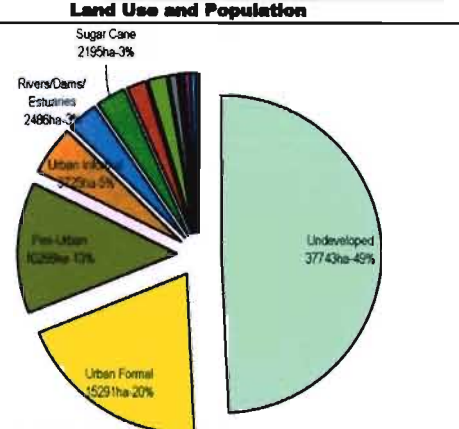
Recreation, Culture, Education Use: Good

Catchment Size and Description



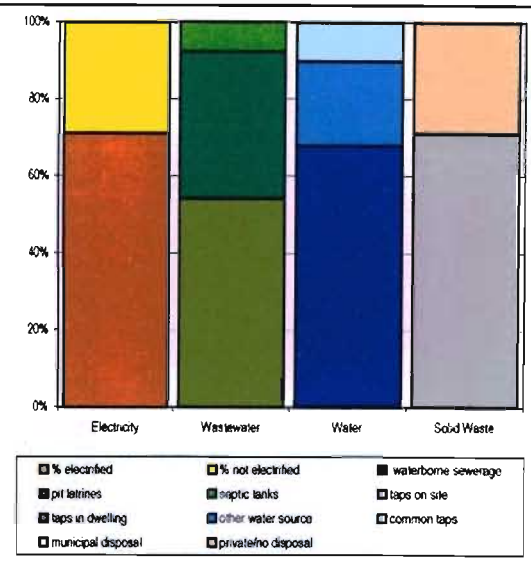
* Undulating coastal plain, steepening inland (into the Valley of 1000 hills). Wide to deeply incised river valleys.
* Contains Inanda Dam; substantial sugar cane & other agriculture; substantial formal, informal & peri-urban settlement at Cato Ridge, KwaXimba, Hillcrest, Kloof/Waterfall, Inanda, Pinetown/New Germany, Clermont/KwaDabeka, Westville, KwaMashu, Phoenix, Newlands, Effingham/Avoca, Morningside & Durban North.
* Commercial, industrial: Cato Ridge, Inanda, Phoenix, Kloof, Hillcrest, Pinetown, New Germany, Westville, Springfield.
* 13 sandwinning operations & a number of quarries downstream of Inanda Dam. Bisasar Rd landfill site.

Land Use and Population

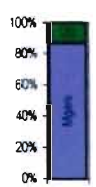


* High population density: 13 people per Hectare. Catchment population: 961 503 people.

Service Levels



Environmental Service Assets



Open space asset (OS): 28 445ha (13% of catchment).

* Umgeni river corridor (steep cliffs, scarps, river, floodplains & large estuary); Beachwood Mangroves; Inanda Dam; 3 golf courses; sports fields; beach & near-shore ocean; Palmiet, Kranzkloof, Burman Bush, New Germany, Cresthollme, Springside, Umgeni Estuary & Danville Park Nature Reserves; large areas of thicket & rocky outcrops in KwaXimba, Inanda & valley of 1000 hills.
* The steep topography of much of the catchment has resulted in large areas of open space remaining undeveloped. The catchment contains a wide variety of habitat types, many areas of which are still in good condition. However, alien vegetation has encroached into many of the unmanaged natural areas. Estuary large & regionally important. Dune cordon has been altered almost in its entirety.

Environmental Services

* Large estuary regionally important for migratory birds and fish breeding.
* Beachwood mangroves regionally important as a refuge & threatened habitat type.
* Inanda Dam, Umgeni River, floodplains & estuary are regionally important in treating, capturing & regulating pollutants, bacteria & sediment washed-off/discharged from industry, settlement & agricultural lands in the large upstream catchment.
* Forests, thicket, grasslands, floodplains, wetlands, the river, estuary & Inanda Dam also perform a local role in treating, capturing & regulating pollutants, bacteria & sediment washed-off/discharged from industry, settlement & agricultural lands in eThekwini.
* River, floodplains, large open spaces & near-shore ocean form important regional corridors for species migrations along the coast & with the hinterland.
* Inanda Dam, Umgeni River, estuary, beach & near-shore ocean are important local & regional recreational/cultural assets.
* Near-shore ocean functional in treating & diluting pollutants & bacteria discharged by river.

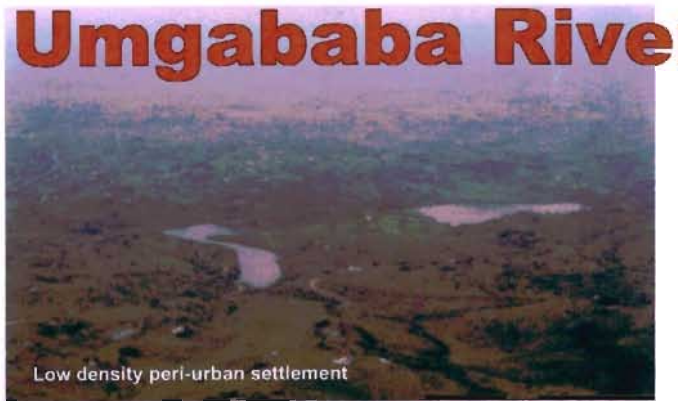
Theme	Status Quo Indicators		
	Pressure	Condition	Response
Air quality	High • Polluting industries in Cato Ridge, Inanda, New Germany, Springfield, Phoenix (12 emissions permits for chemical incinerator, hot dip galvanising, coal consumption, vehicle emissions, bagasse boilers, 9 brick-making kilns, 2 chemical plants, carcass meal plant, ferroalloys furnaces) • No air quality monitoring hence little control of emissions permit conditions • Bisasar Rd landfill site: odour nuisance, methane gas flaring • Chicken farms & abattoir in Cato Ridge: odour nuisance • Localised seasonally generated smoke from informal settlements (3725ha) & cane burning (2195ha) • Localised dust pollution from Inanda Quarry • Localised high density transport infrastructure (463ha road & rail) • High vegetative cover in catchment (although natural habitat limited) with ability to absorb pollutants • [illegible]	Moderate • [illegible] • [illegible] • [illegible] • [illegible]	• Expropriation of land to create a buffer around Bisasar Rd landfill • Cost of installing odour control sprayers around Bisasar Rd • Lobbies by Cato Ridge residents against siting of regional landfill site & further industry in their area • Certain lands surrounding odour-producing activities (e.g. chicken farms) largely sterilised from development for residential uses
Water quality	High • Polluted run-off from greater Pietermaritzburg area, agriculture & informal settlement upstream of eThekwini • Formal residential areas (15 291ha) concentrated into lower portion of catchment. Potential polluted run-off from these areas • Polluted run-off from extensive informal settlement (3725ha), sugar cane & agriculture (3609ha): agrochemicals, sediment, bacteria & nutrients • Polluted run-off & discharges from Bisasar Rd landfill site, 3 wastewater treatment works, industry (1577ha) & transport infrastructure (463ha) • High risk of pollutant spills from transport infrastructure (N2, North Coast Rd, M19, M4, Inanda Rd, railways, near-shore ocean) • Large proportion of the catchment lies outside eThekwini administrative boundary, water quality entering eThekwini therefore difficult to manage	Poor • High turbidity = poor visual quality • Extensive coverage of water hyacinth (Eichhornia crassipes) in lower reaches of Umgeni almost 100% of the year. Scattered coverage of water hyacinth & water lettuce (Pistia stratiotes) upstream of Inanda Dam. Continual management of water hyacinth infestations in Inanda Dam undertaken by Umgeni Water • Inanda Dam performing important role in cleaning poor quality water from upstream catchment • Water from Molweni tributary (through Kloof) good quality • Water from Aller tributary (through New Germany & Clermont) very poor quality (industrial pollution & high eColi) • Water from Palmiet tributary (through Westville) poor quality (turbid, high eColi) • Water from Umhlangane tributary (through KwaMashu, Phoenix, Effingham-Avoca) poor quality (turbid, high eColi) • At Riverdene, Umgeni river a health risk 55% of the year & a serious health risk 22% of the year. Safe for recreation 21% of the year (77 days) • At estuary mouth, river a health risk 54% of the year & a serious health risk 23% of the year. Safe for recreation 23% of the year (84 days) • [illegible]	• Releases from Inanda required to clear water hyacinth for canoe races • Costs of clearing water hyacinth in Inanda Dam = R162 000 for a 4 year programme • Costs associated with clearing beach when floods discharge water hyacinth onto beaches • Gastro-intestinal diseases contracted during Duzi Canoe Marathon ('Duzi Guts') • Bad publicity associated with use of the Umgeni River for recreation due to high eColi levels
Water quantity	High • 5 major dams on the Umgeni (Midmar, Albert Falls, Henley, Nagle, Inanda) with abstraction for regional supply & thus significant flow reduction (abstraction to supply PMB & eThekwini) (866 million litres abstracted per day from 5 dams: 150 million litres from Inanda, 516 million litres from Nagle, other from Midmar & Albert Falls) • 5 large dams with high evaporative losses • Extensive water consumptive land cover in catchment (forestry, agriculture, alien vegetation)	Moderate • [illegible] • [illegible]	• Major investment into Inanda Dam as a regional water supplier • Costs associated with breaching Umgeni mouth
Flooding Risk	High • eThekwini located at the lower end of a large regional river catchment = high inherent flood risk from upstream. Areas outside administrative boundary cannot be easily managed to reduce flood risk • Steep topography & incised valleys with narrow floodplains & thus inherent flood risk • Concentrated & dense settlement patterns with high degree of localised sealed surfacing (21 471ha - 28% of catchment) • Location of sealed surfaces (e.g. Pinetown/NewGermany at head of Aller & Palmiet) increases flood risk • Increasing localised development & sealing of surfaces • Significant dams, containing small floods but not large ones. Stormwater infrastructure not designed to retain/detain flows • Extensive sugar cane & agriculture causing accelerated run-off seasonally • Pressure for development of areas of well-located open space for housing (i.e. further sealing)	High • Localised increase in frequency & intensity of flooding = undersized existing stormwater infrastructure causing backflooding • Reduced frequency of small floods in main Umgeni river as a result of dams & consequent investment into development on floodplains (e.g. Springfield, informal settlements) = high risk during large floods	• Canalisation of Umgeni through Springfield to protect industrial/commercial/infrastructural investment on floodplains • Flood damage & loss of life along Palmiet & Umhlangane tributaries
Sedimentation & Erosion	High • Extensive land uses with high soil erosion risk in upstream catchment - outside eThekwini administrative boundary = difficult to manage high impact activities • Steep topography & sandy, erodible soils = inherent erosion risk • Extensive agriculture (3579ha) & informal settlement (3725ha) with high potential for soil erosion • Steep topography limits agriculture & encourages removal of floodplain vegetation for agriculture • Springfield fault runs from Spaghetti Junction to Mgeni River near Alpine Rd = instability risk • Agriculture on steep slopes causing soil erosion • High pressure for development (construction activities) in catchment • 5 major dams in greater catchment (= 5 major sediment traps) • 13 sandwinning operations & 1 operational quarry in catchment	Moderate • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible]	• Reduced of water supply capability of Inanda Dam and potential investment into new regional water supply dam • 13 sandwinning operations in catchment • Expenditure of Drainage and Coastal Engineering on clearing sediment from stormwater channels in Dbn North • Cost of engineering a sediment trap to protect Beachwood Mangroves • Cost of breaching estuary mouth
Loss of biodiversity	High • Existing dense development in mid & lower catchment • High development pressure throughout catchment • High pressure for economic growth in catchment • Localised high harvesting pressure for wood, medicinal plants & fibre	Low • Wide variety of habitats in good condition remain (& many of these are protected) • Estuary is a regional refuge for migratory birds (Pelicans) • Large regional system providing link from coast to hinterland (to Drakensberg) • Good estuarine icthyofauna	• A number of conservancies & high profile lobby groups have become established throughout the catchment • Cost of constructing sediment trap to protect the Beach wood Mangroves • Areas of KwaXimba have been incorporated into the proposed iNkhambathini Game Park indicating their high biodiversity value • Location of Umgeni Bird Park adjacent to estuary. Economic returns generated
Agricultural production	High • Steep topography, rock outcrops & sandy, erodible soils limit opportunities & access for agriculture • High levels of urbanisation has resulted in limited undeveloped land remaining in flatter areas • Alien plant invasions reduce grazing potential of grasslands • Reduced flooding of floodplains downstream of Inanda Dam (= reduced soil fertility)	Poor • Small scale subsistence farming predominates • Well located agricultural land is being converted to more valuable residential/commercial/industrial uses	• Food security not achieved; expenditure on importation of raw products into the area
Recreational, Cultural, Educational Uses	High • Large (and dense) population with high user demand • Regional recreational demand • High development pressure on remaining open spaces • Poor water quality limits value of river, estuary & near shore ocean as a contact recreation asset	Good • Wide variety of & access to recreational opportunities/assets • Recreational assets mostly good quality & well-managed (mostly located in former Durban Municipal/Central Area) • Dramatic topography = visually appealing landscape • Uneven distribution of recreational open space relative to population distribution	• Significant investment into recreational facilities in catchment for Duzi Canoe Marathon, Inanda Dam and at beachfront • Income generated through use of nature reserves, golf courses • High investment into & returns from developments with views onto natural features (Krantzkloof Gorge, Umgeni estuary, ocean, Palmiet) • Tourism Meander in Hillcrest/Bothas Hill

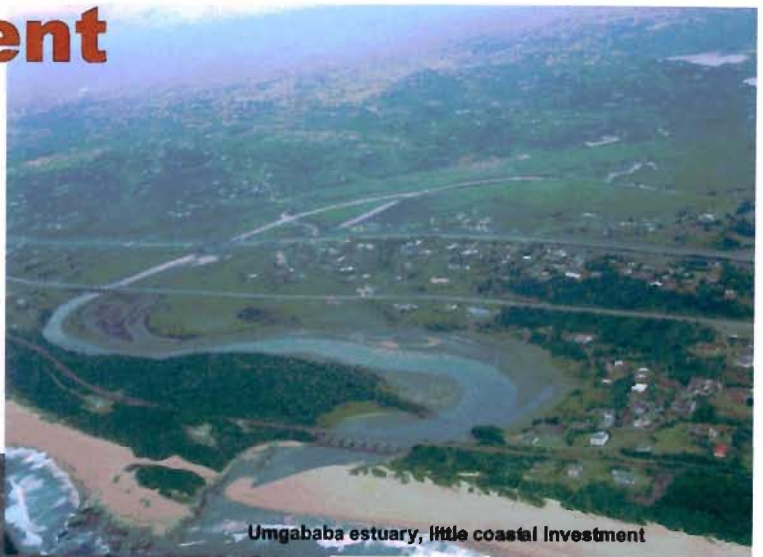
Mgeni River Catchment

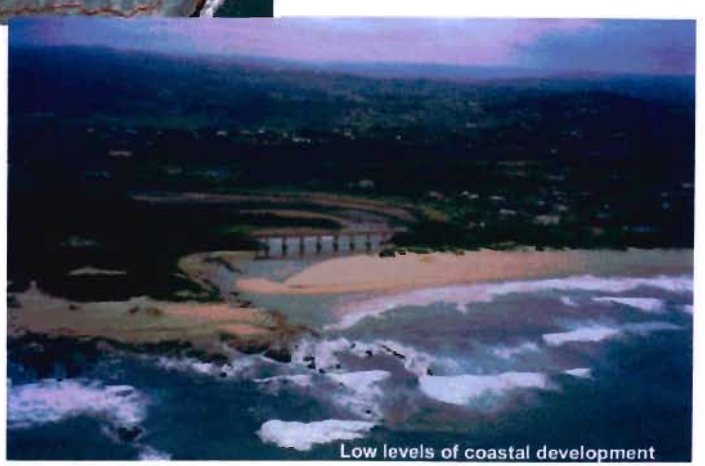
Mgeni River Catchment Status Quo Rating: RED

Environmental Asset Opportunities and Constraints	Development Scenario	Planning and Management Implications	Responsibility
Development Opportunities: * Wild hinterland for development of game reserve and tourism. * Inanda Dam for development of recreation and tourism. * Estuary and river for recreation/tourism. **Development Constraints:** * Main catchment in the eThekwini Municipal Area with extensive levels of development generating major cumulative impacts that are then concentrated at the coast. * Complex structure of sub-catchments each with their own development profiles and management requirements.	**Spatial Development Framework indicates:** * Urban Core in lower catchment: Durban North, Reservoir Hills, Westville, Pinetown formal residential areas, Springfield, Phoenix, Effingham/Avoca, New Germany industrial areas, northern beachfront recreational area with high service levels. * Urban Periphery: KwaMashu, Ntuzuma, Inanda, Newlands mixed residential areas with moderate service levels in the lower catchment of the catchment; Fredville residential area and Harrison Flats industrial area with moderate to high service levels in the upper catchment. * Rural Periphery in the remainder of the catchment: Kloof, Gillitts and Hillcrest formal residential areas with moderate to high service levels; Valley of a Thousand Hills, KwaXimba rural/agricultural areas with low service levels. * Major Economic Investment Point at Umhlanga. * Mixed Investment Points at KwaMashu, Link City (and HPPTN Node) and Effingham Avoca in the Umhlangane sub-catchment. * Rural Investment Point at KwaXimba in the upper catchment. * HPPTN along R102 and R103, HHPTN Node at Link City and Feeder Routes along M4, MR93, etc. **Urban Growth, Informal Upgrading/Extension and Industrial Growth Scenario with:** * Expansion and consolidation of industry and infrastructure in Springfield and Effingham-Avoca in the Umhlangane sub-catchment in the short to medium term and Cato Ridge in the Mshwati sub-catchment in the long term. * Limited expansion of Phoenix and New Germany industrial areas due to limited flat land (in the Umhlangane and Palmiet sub-catchments respectively). * Formalisation, upgrading and infill of residential settlement throughout the municipal portion of the catchment but particularly at KwaMashu, Inanda, Ntuzuma and Newlands in the Umhlangane sub-catchment, Clermont/ KwaDabeka, Molweni and Langefontein in the Molweni sub-catchment and Fredville and KwaXimba in the Mncgweni and Mshwati sub-catchments. * Ongoing urban development and informal settlement around Pietermaritzburg and agricultural and rural activities upstream of the municipal boundary. * Conversion of the more accessible portions of relatively pristine natural hinterland to rural settlement and grazing and agricultural fields.	**Anticipated Impacts on Environmental Services Assets/Development Intentions:** * Urban/industrial growth and informal upgrading and extension scenario will result in a major increase in sealed surfaces and significantly intensified land use impacts with increased stormwater runoff and flooding risk, increased erosion/sedimentation and increased water pollution to an extent where its existing "red" status is likely to be reinforced and exacerbated. * Potential conflict between expansion, upgrading and infill development with water-based tourism/recreation, which is dependent on good environmental quality. Durban's Golden Mile beaches are directly affected by water quality from the Mgeni River. * Substantial investment exists on the Springfield floodplain and other potentially flooded areas. Increased flooding risk as a result of expansion and infill developments will increase the flood risk in these areas. * Increased development combined with poor land use management in upper catchment will result in increasing sedimentation and pollution of the Inanda Dam, which will undermine the strategic water supply and recreational function of the dam in the municipal area.	
		Strategic Responses: * There is a need to manage development pressures in the catchment and to undertake remedial action in order to ensure that the current "red" status of the catchment is not exacerbated. Environmental quality must be protected and enhanced for existing and future users. Strategic assets such as Inanda Dam, the Mgeni River and estuary and the main Durban beachfront must be protected. This can be done by providing adequate bulk infrastructure, improving service levels in the upper catchment, internalising environmental quality protection costs in new developments, bolstering the environmental service supply capacity in the catchment, identifying and managing high impact activities such as informal settlement. * Assess and manage sub-catchments according to their development/settlement and environmental condition profiles. * Monitor development and land uses outside the eThekwini boundary to ensure that densities do not increase to a point where environmental quality and development potential within the municipal area is threatened.	* Urban Strategy Department * Central, Inner and Outer West Operational Entities Planning and Development departments and Parks and Natural Areas departments * Environmental Management Branch * Metro Water Services
		Land Use Responses: * Monitor and manage development and land uses in upper catchment in conjunction with upstream authorities to ensure that poor water quality and sedimentation of Inanda Dam do not undermine its function as a strategic water source and recreational node for the most densely settled areas in eThekwini. * Ensure that future developments internalise the costs of protecting water and air quality, and controlling soil erosion to protect strategic assets, such as Inanda Dam and Mgeni River, and the coastal environment (particularly the Durban beachfront) for recreation/tourism and existing high value property development. * Identify land with high agricultural potential and integrate with urban settlement expansion. * Contain future urban development within the urban edge and limit densities on the urban periphery to ensure that the upper catchment continues to function as a "sponge" and buffer protecting water quality and managing sediment levels for the coastal strip. * Ensure that the formalisation of informal settlements and new low-income housing developments are complemented by investment in the protection of downstream environmental quality for social and economic reasons. * Promote recreational and tourism development and/or use of the Inanda Dam and the Mgeni River and estuary. * Investigate the potential of the wild hinterland for the development of a game reserve and eco-tourism.	* Durban Metro Housing * Central, Inner and Outer West Operational Entities Planning and Development departments and infrastructure service departments * Environmental Management Branch * Urban Strategy Department * Area Based Management Co-ordinators * Economic Development Department
		Environmental Service Asset Responses: * Secure the dune cordon, Beachwood Mangroves, Mgeni estuary, Burman Bush Nature Reserve, Mgeni River ecological corridor, Palmiet Nature Reserve, Krantzkloof Nature Reserve, Inanda Dam and surrounds, the major inland open spaces. Ensure that these high priority environmental service assets are consolidated and protected from settlement encroachment. * Ensure that coastal assets are adequately managed and protected to accommodate recreational activities related to the beach, Blue Lagoon, Beachwood Mangroves and sports facilities. * Maintain the large environmental service assets in the upper catchment to buffer the eThekwini Municipal Area from upstream impacts and provide resource-based economic opportunities.	* Drainage and Coastal Engineering * Environmental Management Branch * Central, Inner and Outer West Operational Entities Parks and Natural Areas departments
		Infrastructural Responses: * In order to protect major water-based tourism/recreation assets and environmental quality at the coast, future urban/industrial development will need to internalise environmental protection costs on-site and through upgraded bulk infrastructure. * Major new developments must provide adequate on-site stormwater infrastructure, such as detention facilities, to minimise downstream stormwater impacts and flooding risks. Bulk stormwater infrastructure or system must be provided off-site to deal with the anticipated increase in surface runoff. * Review settlement standards being applied in upper portion of catchment to prevent further impacts on downstream water quality, coastal environmental quality and high value tourism assets along the coast. * Adequate bulk wastewater disposal infrastructure needs to be provided to ensure that water quality in the watercourses, estuary and near shore ocean is not polluted to a point where its recreational/tourism potential is undermined or lost. * Bulk wastewater treatment and disposal infrastructure must be subject to stringent operational controls to ensure that effluent spills do not adversely affect water and environmental quality along the coast. * Develop and enhance the capacity of the natural resource base to assist with the mitigation of impacts as part of the stormwater management and waste treatment system for the catchment.	* Durban Metro Housing * eThekwini Wastewater Services * Drainage and Coastal Engineering Department

Umgababa River Catchment







Catchment Rating: Green

Status Quo Statement: Umgababa River Catchment

The Umgababa river catchment is primarily peri-urban. Levels of servicing are very low. Limited environmental resource asset remains, confined to the coastal strip and riverine areas.

Negative environmental aspects of the catchment are:

* Diminished river flow.
* Limited biodiversity.
* Declining agricultural production.
* Limited diversity and capacity of accessible recreational open spaces.

Positive environmental aspects of the catchment are:

* Good air quality.
* Good water quality in the river and estuary.
* Low flood risk.
* Little erosion and low rates of sedimentation of the estuary.
* Good quality coastal zone.

Summary of Conditions

Water Quantity: Moderate

Loss of Biodiversity: Moderate

Agricultural Production: Moderate

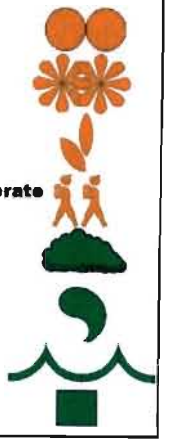
Recreation, Culture, Education Use: Moderate

Air Quality: Good

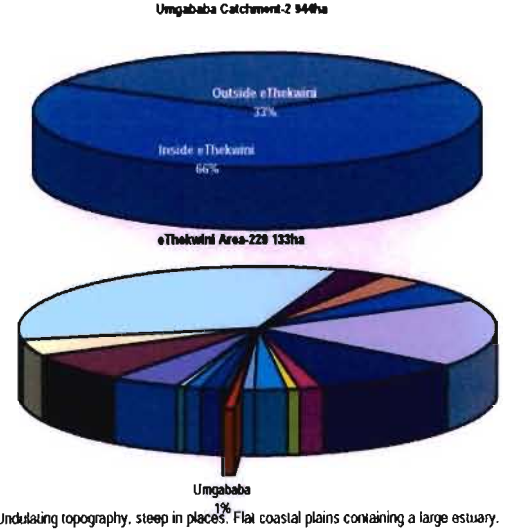
Water Quality: Good

Flooding Risk: Low

Sedimentation & Erosion: Good

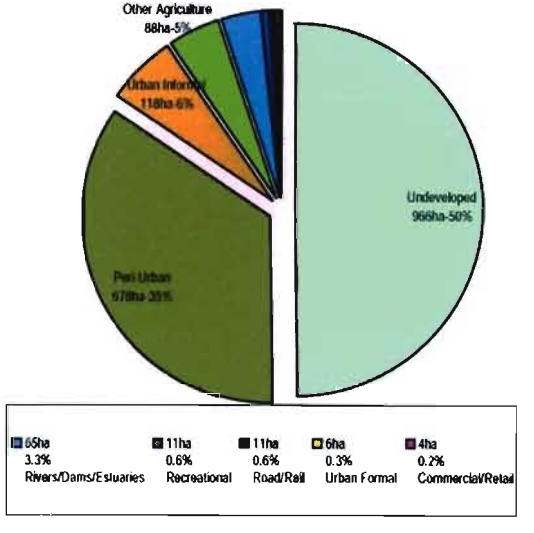


Catchment Size and Description



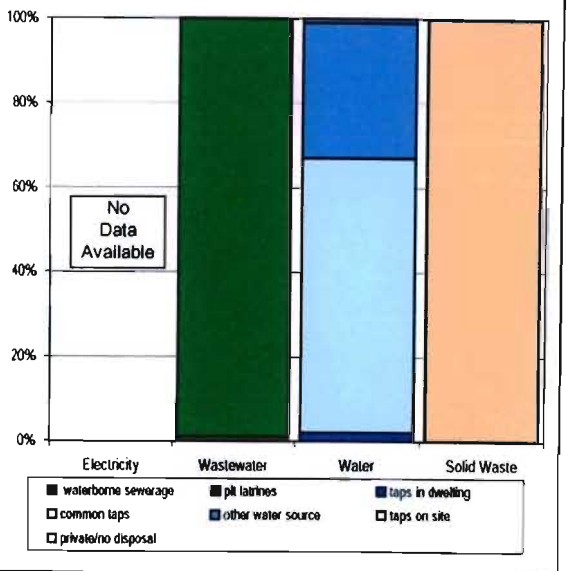
* Undulating topography, steep in places. Flat coastal plains containing a large estuary.
* Low to medium density peri-urban settlement throughout most of the catchment, interspersed with small-scale agriculture. Contains Mnini & Umgababa Dam.

Land Use and Population

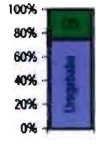


* Low population density: 3 people per Hectare. Catchment population: 5960 people.

Service Levels



Environmental Service Assets



Total open space asset: 416ha (21% of the catchment).

* Estuary, river & floodplains; dune forest & thicket on dune cordon; beach, rocky shore & near-shore ocean; Umgababa Dam.
* Much of the land has been converted to settlement & agriculture, with very little natural open space remaining. Most open spaces have been encroached by alien vegetation. The estuary is medium sized & functional. Floodplains are wide in the lower catchment & remain functional in many areas.

Environmental Services

* River, floodplains, estuary & near-shore ocean performing local role in treating pollutants & bacteria washed off/discharged from settlement & agricultural lands in catchment.
* Floodplains, estuary & beaches capture & regulate sediment washed off from agricultural lands & settlement in catchment.
* Floodplains, estuary & dam functional in reducing flood peaks in the river.
* Dune cordon performing important local role in protecting adjacent land from ocean winds, salt-spray & storm sea penetration. Dune vegetation functional in stabilising erodible dune slopes.
* Dune cordon, beach & near-shore ocean are important local & regional recreational assets.
* Dune cordon & marine environment important regional refuges & corridors for species migrations.

Umgababa River Catchment

Theme	Status Quo Indicators		
	Pressure	**Condition**	**Response**
Air quality	**Low** * Localised smoke from informal & peri-urban settlement * Low density transport infrastructure * Undulating topography conducive to atmospheric dispersion	**Good** * Localised smoke plumes * No air quality data available because no air quality monitoring occurs	**None**
Water quality	**Low** * Low density settlement, little urban, industrial or transport infrastructure run-off & discharge * Potential bacteria, nutrients & sediment carried in run-off from agricultural lands (88ha) * Good vegetative coverage, functional floodplains & river * Umgababa dam & estuary have high capacity for treating pollutants * Estuary open all year	**Good** * Below Umgababa Dam, river a health risk 13% of the year & safe for recreation 87% of the year * At the estuary mouth, water is a health risk 11% of the year & safe for recreation 89% of the year (325 days) * Water turbid = poor visual quality	* High potential for recreation, potable & irrigation use of river, estuary & near-shore ocean
Water quantity	**Moderate** * Umgababa dam retaining flow, evaporative losses = reduced river flow. Dam relatively large for size of river & high risk of reducing flow substantially during dry years * Moderate coverage of alien vegetation & agriculture = water consumptive land uses * Small scale abstractions for local water supply in peri-urban areas * Undulating topography = infiltration * Good coverage of wetlands, floodplains = flow regulation * Reasonable vegetative cover in catchment = infiltration & flow regulation * Low coverage of sealed surfaces in catchment (139ha - 7% of catchment)	**Moderate** * Estuary open all year * Annual water quantity flowing in river remains similar, but flow patterns are likely to have changed ([illegible] flood peaks, lower normal flows) as a result of water consumptive uses & dam	**None**
Flooding Risk	**Low** * Low coverage of sealed surfaces in catchment (139ha - 7% of catchment) * Reasonable vegetative coverage in catchment * Umgababa dam large for size of river = stormwater detention capability * Undulating topography = low inherent flood risk * Functional floodplains in many areas = capacity for containing floods	**Low** * Localised flooding during high rainfall events	**None**
Sedimentation & Erosion	**Moderate** * Umgababa dam = major sediment trap in small river system Settlement & agriculture on erodible soils Areas covered with alien vegetation = high risk of soil erosion Some agriculture in floodplains = risk of soil erosion	**Good** * Estuary rocky, not silted - mouth stays open all year * Water turbid	**None**
Loss of biodiversity	**High** * Low density sprawling settlement, with extensive land conversion to settlement & agriculture * Tribal land regime with little restriction on immigration to the area = local population growth & further pressure for land conversion * High pressure for natural resource harvesting for largely unserviced population * Encroachment of alien vegetation * No protected natural open space * Little/no investment into management of natural open spaces * Localised illegal dumping	**Moderate** * Medium-sized & functional estuary (open all year) * Moderate coverage of alien vegetation in catchment (has encroached on natural open spaces) * Limited biodiversity areas inland, coastal biodiversity assets ([illegible], floodplains etc.) more valuable	* Limited opportunity for development / investment based on biodiversity asset
Agricultural production	**Moderate** * Land use largely settlement, [illegible] agricultural land [illegible] * Increasing pressure for land conversion to settlement with extension of eThekwini boundary to include the catchment * Water available in Umgababa Dam for irrigation	**Moderate** * Agricultural land declining, land conversion to settlement * Localised areas small scale agriculture	**None**
Recreational, Cultural, Educational Uses	**Moderate** * Little/no investment into recreational infrastructure & development * High levels of & pressure for land conversion to settlement & agriculture, leaving little [illegible] open space * Low user demand for existing assets	**Moderate** * Poor access to recreational spaces * Low diversity of recreational opportunities * Unequal distribution of recreational open space * Good quality recreational/aesthetic amenity in coastal zone [illegible] * Good quality water = recreational opportunities	* Opportunities exist for development & utilisation of recreational open spaces in coastal zone = untapped economic potential * Low investment into residential development along the coast = potential for property value upliftment with improvement of access to & status of coastal asset

Umgababa River Catchment Status Quo Rating: GREEN	Environmental Asset Opportunities and Constraints	Development Scenario	Planning and Management Implications	Responsibility
	Development Opportunities: * Recreational development along the coastal strip based on good quality coastal environment. **Development Constraints:** * Small catchment situated mainly in the coastal strip with moderate capacity to deal with impacts from increasing settlement pressure.	**Spatial Development Framework indicates:** * Rural Periphery throughout the catchment, consisting predominantly of rural settlement and agricultural activities with low service levels. * Rural Investment Point at Umgababa in the lower catchment. **Rural Scenario with:** * No major proposed urban developments. * Consolidation of existing settlement.	**Anticipated Impacts on Environmental Service Assets/Development Intentions:** * Absence of urban development will result in a continuation of the status quo with no substantial increase in development impacts. * An intensification of rural settlement may increase soil erosion, reduce water quality and increase sedimentation. * Inland developments may affect quality of coastal zone.	
			Strategic Responses: * In order to maintain existing high environmental quality and protect the tourism and recreational potential of the coastal strip, ensure that rural settlement does not intensify to a point where water quality, soil erosion and sedimentation levels are degraded.	* Area Based Management Co-ordinators * Urban Strategy Department * South Operational Entity Planning and Development Department and parks Department * Economic Development Department
			Land Use Responses: * Maintain the existing rural/agricultural land uses and ensure that rural settlement densities are commensurate with the low service levels envisaged for the catchment to protect the current function of the catchment as a "sponge" or buffer providing good water quality to the coast. * Establish the Umgababa Rural Investment Point in the lower portion of the catchment to serve the surrounding rural settlements. * Investigate the potential for establishing a low-impact coastal recreational node with adequate support facilities in the catchment.	* Area Based Management Co-ordinators * Urban Strategy Department * South Operational Entity Planning and Development Department * Economic Development Department
			Environmental Service Asset Responses: * Secure the dune cordon, the lower reaches of the Umgababa River corridor and its northern tributary corridors, and ensure that these high priority environmental service assets are protected from settlement encroachment and pressures. * Improve *the inter-catchment linkages* with the Ngane, Umzimbazi, Mkhomazi and Lovu River catchments.	* Environmental Management Branch * South Operational Entity Parks and Recreation Department
			Infrastructural Responses: * Provide a minimum level of services to support rural and agricultural activities within the catchment and to minimise the impacts of these activities on the environmental quality and recreation/tourism potential of the coast. * Provide for on-site wastewater disposal (and not waterborne sewerage) to restrict urban development in the catchment, at least in the short to medium term. * Provide households with an adequate electricity supply to reduce the harvesting of natural products and protect the remaining vegetation cover in the catchment. * Provide controlled road and pedestrian access to the beach and proposed coastal recreational facilities.	* eThekwini Water and Waste Services * Durban Metro Electricity Department * Traffic and Transportation Department

Umgababa River Catchment

APPENDIX 2

INTRODUCTION TO INTERVIEW: MUNICIPAL STAFF

(Introduction by phone; adapted for email)

1. Introduce myself – Currently undertaking a Masters degree in Environmental Management at the University of Natal. Worked for provincial government in KZN and Canada as a town and regional planner for approx. 8 years. Interested in the connection between environmental issues and planning, and in the impacts of development decision-making on the environment (i.e. environmental decision-making).

2. Introduce thesis topic – In broad terms, my thesis looks at environmental decision-making in the eThekwini Municipality. As a case study I am reviewing the Urban Strategy Department's recently completed project "eThekwini Catchments 2002 – A Strategic Tool for Planning". I would like to get a sense of how the eThekwini Catchments Report is:
   (1) perceived by municipal staff across a range of sectors in the municipality; and
   (2) being used by staff in both their strategic planning and day-to-day decision-making concerning development in the municipal area.

3. Request to interview – I would appreciate an opportunity to meet with you to discuss your respective department's perspective on this project, and the use of the eThekwini Catchments report in your work.

4. Interview details – I would like to meet with you for no more than one hour at your office, or elsewhere should that suit you better. I will need to tape the interview, in order to obtain an accurate record of our discussion. Taping also means that I won't slow you down while taking notes. Your name will remain anonymous, although I will need to make reference to the name of your department, and your position in the department. My interview will aim to get a sense of your department's perspective on the project, although you will be welcome to give your personal opinion if it differs from your department's perspective.

5. Although the interview is intended to be an informal discussion, the following outline gives you a sense of the issues I would like to discuss with you:

   - A brief description of your department and its responsibilities and functions, as well as your area of responsibility.
   - Your involvement in the eThekwini Catchments project.
   - The idea of using catchments as a basis for improved strategic planning and integrated development planning.
   - The status quo assessment of each of the 18 catchments identified using environmental indicators.
   - Linkages to the Integrated Development Plan, the Area-Based Management initiative being piloted in the city, and other city initiatives.
   - The use of the eThekwini Catchments report in your department's strategic and day-to-day work.

APPENDIX 3

'ETHEKWINI CATCHMENTS 2002': GUIDELINE INTERVIEW QUESTIONS

CONSULTANTS

A: Introduction to the interview

Explained to consultant being interviewed what I wanted to gain from the interview:

- An understanding of the 'eThekwini Catchments 2002' project process and the consultants' role in the project;
- An understanding of the different perspectives of the various role-players in the project and the wider municipal administration, and how this did or did not influence the project process and end product;
- The potential (or not) of the project to influence planning, development and environmental management in the city.

B: Questions: General

1. Please could you give me an overview of your professional experience, the type of work you are involved in, and areas of interest or expertise.

C: Project Process and key influences on the project direction/focus

2. Provide background to eThekwini Catchments project – how the project got initiated, and how the consultant team got involved.

3. The catchment approach – where did this idea originate from? What is the value of this approach?

4. What other key ideas/concepts underpin this project? Elaborate.

5. Explain the project process – how municipal role-players got involved in the project. Number of meetings, function and format of meetings (debate or merely updating work?)

6. Who were the most dominant role-players in the project? Did they buy in to the concept of using catchments in this way? What ideas did they bring to the project? How did their ideas influence the development of the project and the final result?

7. Do you think the requirements of the terms of reference were met? (Read terms of reference – process of integrating environmental issues into planning vs. environmental technical data set). Did the terms of reference change over the duration of the project? If so, why and how?

8. How did indicators get chosen as the key methodology in the project? Were there any conflicting views on the use of indicators, particularly the focus on biophysical indicators? Explain.

9. Were there any (other) conflictual issues, disagreements, negotiations, compromise as part of the project? How did these get resolved?

D: Influence and application of the project in planning, development and environmental management in the city

10. How has the project contributed to achieving the integration of environmental resource management with city planning processes and programmes, such as ABM, the IDP, sectoral planning, strategic planning and LUMS? Has the project achieved its aim? Do you think it will be able to influence planning and development in the city?

11. Have you had any feedback about how the project has been used in the day-to-day work of city officials, as well as their strategic planning exercises?

12. Are there any other issues relating to the project – process and outcomes – that you would like to discuss?

PROJECT MANAGERS (Urban Strategy)

A: Introduction to the interview

Explained to official being interviewed what I wanted to gain from the interview:

- An understanding of the 'eThekwini Catchments 2002' project process and the person's role in the project;
- An understanding of the different perspectives of the various role-players in the project and the wider municipal administration, and how this did or did not influence the project process and end product;
- The potential (or not) of the project to influence planning, development and environmental management in the city.

B: Questions: General

1. Please could you give me an overview of your department and your role and responsibilities in the department, as well as your professional experience. Also background information on the institutional arrangements in the city at the time.

C: Project Process and key influences on the project direction/focus

2. Provide background to eThekwini Catchments project – how the project got initiated, and your role in the project.

3. The catchment approach – where did this idea originate from? Do you support this approach?

4. What other key ideas/concepts underpin this project? Elaborate.

5. Explain the project process – how municipal role-players got involved in the project. Number of meetings, function and format of meetings (debate or merely updating work?)

6. Who were the most dominant role-players in the project? Did they buy in to the concept of using catchments in this way? What ideas did they bring to the project? How did their ideas influence the development of the project and the final result?

7. Do you think the requirements of the terms of reference were met? (Read terms of reference – process of integrating environmental issues into planning vs. environmental technical data set). Did the terms of reference change over the duration of the project? If so, why and how?

8. How did indicators get chosen as the key methodology in the project? Were there any conflicting views on the use of indicators, particularly the focus on biophysical indicators? Explain.

9. Were there any (other) conflictual issues, disagreements, negotiations, compromise as part of the project? How did these get resolved?

D: Influence and application of the project in planning, development and environmental management in the city

10. How has the project contributed to achieving the integration of environmental resource management with city planning processes and programmes, such as ABM, the IDP, sectoral planning, strategic planning and LUMS? Has the project achieved its aim? Do you think it will be able to influence planning and development in the city?

11. How has the project and the resulting report influenced your work, and the work of your department, both strategically and in your day-to-day functions?

12. Have you had any feedback about how the project has been used by other departments in the city?

13. Are there any other issues relating to the project – process and outcomes – that you would like to discuss?

MUNICIPAL STAFF (involved in the Catchments Project process)

A: Introduction to the interview

Explained to official being interviewed what I wanted to gain from the interview:

- An understanding of the 'eThekwini Catchments 2002' project process and the person's role in the project;
- An understanding of the different perspectives of the various role-players in the project and the wider municipal administration, and how this did or did not influence the project process and end product;
- The potential (or not) of the project to influence planning, development and environmental management in the city.

B: Questions: General

1. Please could you give me an overview of your department and your role and responsibilities in the department, as well as your professional experience.

C: Project Process and key influences on the project direction/focus

2. How did you get involved in the eThekwini Catchments project? What role did you play?

3. What is your perspective the concept of using catchments as an approach to integrate environmental concerns into strategic and spatial planning in the city? What is your overall perspective on the project?

4. Who were the most dominant role-players in the project? Did they buy in to the concept of using catchments in this way? What ideas did they bring to the project? How did their ideas influence the development of the project and the final result?

5. Do you think the requirements of the terms of reference were met? (Read terms of reference – process of integrating environmental issues into planning vs. environmental technical data set). Did the terms of reference change over the duration of the project? If so, why and how?

6. How did indicators get chosen as the key methodology in the project? Were there any conflicting views on the use of indicators, particularly the focus on biophysical indicators? Explain.

7. Were there any (other) conflictual issues, disagreements, negotiations, compromise as part of the project? How did these get resolved?

D: Influence and application of the project in planning, development and environmental management in the city

8. How has the project contributed to achieving the integration of environmental resource management with city planning processes and programmes, such as ABM, the IDP, sectoral planning, strategic planning and LUMS? Has the project achieved its aim? Do you think it will be able to influence planning and development in the city?

9. How has the project and the resulting report influenced your work, and the work of your department, both strategically and in your day-to-day functions?

10. Are there any other issues relating to the project – process and outcomes – that you would like to discuss?

MUNICIPAL STAFF (not involved in the Catchments Project process)

A: Introduction to the interview

Explained to official being interviewed what I wanted to gain from the interview:

- Awareness of project and use of the report information.
- Usefulness of this type of project, its concepts and information to your specific role and responsibilities.
- Influence of the project on planning, development and environmental management in the city.

B: Questions: General

1. Please could you give me an overview of your department and your role and responsibilities in the department, as well as your professional experience.

C: The project

2. Are you aware of the catchment project? If so, please elaborate/explain your understanding of the project.

3. If not, I will give a brief overview of the project. Describe how project originated, process, contents of report -- brief and descriptive.

4. What are your overall perspectives on the project, its concepts and ideas?

D: Influence and application of the project in planning, development and environmental management in the city

5. How has the project and the resulting report influenced your work, and the work of your department, both strategically and in your day-to-day functions?

6. How has the project contributed to achieving the integration of environmental resource management with city planning processes and programmes, such as ABM, the IDP, sectoral planning, strategic planning and LUMS? Has the project achieved its aim? Do you think it will be able to influence planning and development in the city?

7. Are there any other issues relating to the project that you would like to discuss?